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Volume 18, Number 6

DECEMBER 1955

Postgraduate Medicine

Official Journal
of the Interstate
Postgraduate
Medical Association

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Modell's Relief of Symptoms

See SAUNDERS Advertisement on pages A-14 and A-15

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PENICILLIN WITH BENEMID®

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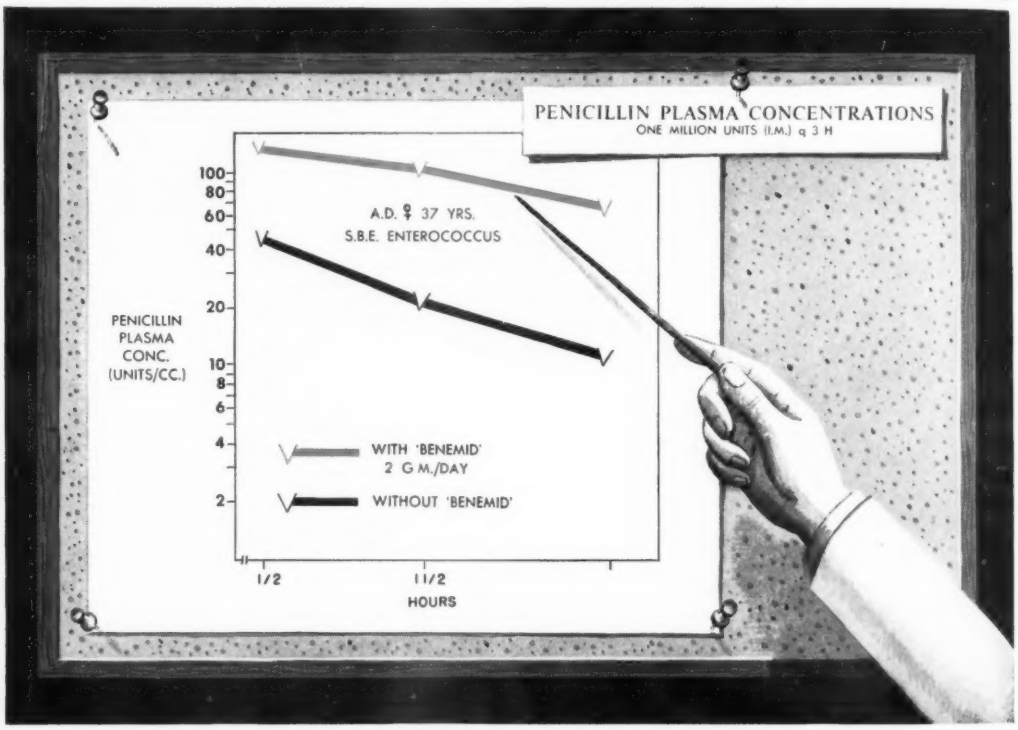

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References: 1. Antibiotics & Chemotherapy 2:555, 1952. 2. A.M.A. Exhibit, June 1951.

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TABLE *of* CONTENTS

SPECIAL ARTICLES

Modern Otology
JULIUS LEMPERT, M.D. 475

Surgery for Peptic Ulcer
F. JOHN LEWIS, M.D. 486

DIAGNOSTIC CLINICS

The Adrenal Cortex and Its Relation to Disease
JOHN C. BECK, M.D. 490

The Surgical Relief of Pain
JOSEPH P. EVANS, M.D. 500

Cancer of the Breast
CARL W. EBERBACH, M.D. 510

Surgical Emergencies in the Newborn
COLIN C. FERGUSON, M.D. 519

Regional Enteritis
SAMUEL F. MARSHALL, M.D. 528

PEDIATRICS IN GENERAL PRACTICE

Evaluation of Diagnostic Methods in Allergic Conditions of Children
A. MATHESON, M.D. 535

SCIENTIFIC EXHIBIT

Office Management of Ocular Injuries
MALCOLM A. McCANNEL 542

GENERAL PRACTICE REVIEW

The Treatment of Cardiac Arrest
JULIAN JOHNSON, M.D. 553

(Continued on page A-10)

CLINICOPATHOLOGIC CONFERENCE

Case Report
FROM THE VETERANS ADMINISTRATION HOSPITAL, HINES, ILLINOIS 553

DEPARTMENTS

EDITORIALS 565

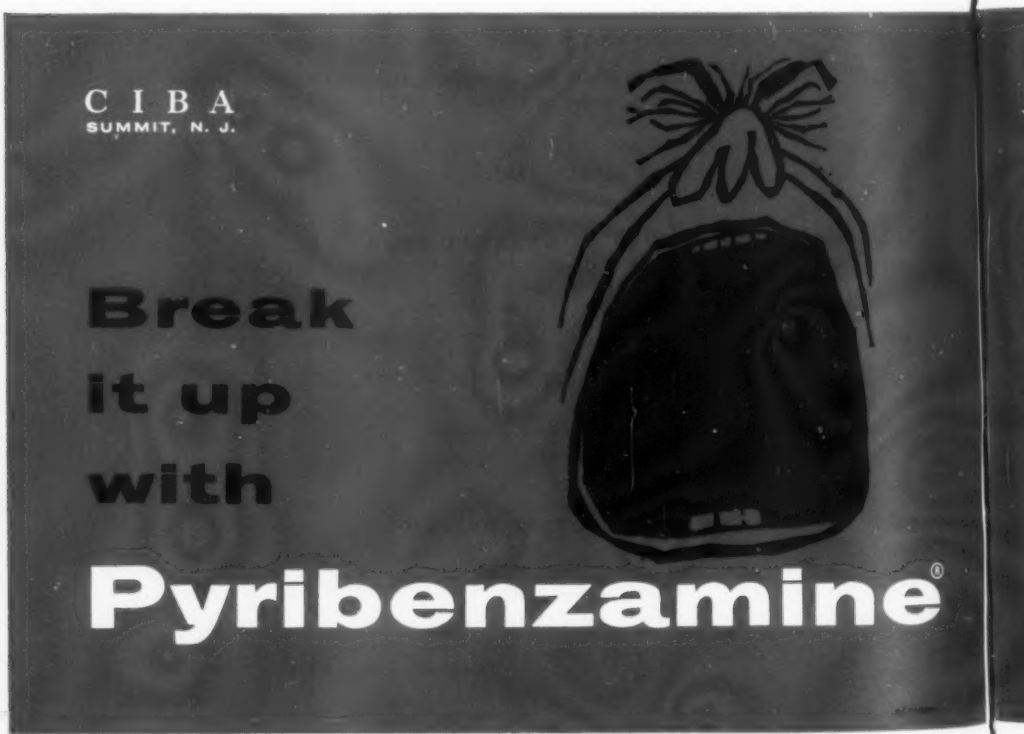
Prednisone and Prednisolone
Oral Mucosa Smears in Chromosomal Sex Detection
Children's Exocrine Research Foundation
Award to Dr. Charles W. Mayo

INDEX TO VOLUME 18 569

"PLACEBO"—Jackson A. Smith, M.D. A-18

YOUR QUESTIONS ANSWERED A-21

Habitual Abortion
Kidney Stones
Vitiligo
Radiation After Mastectomy



WHAT'S HAPPENING IN MEDICINE ..... Facing A-32-33

FORENSIC MEDICINE A-34

Tumor and Trauma

PHILIPP R. REZEK, M.D.

MEDICINE FROM ABROAD A-56

NEW FOR YOUR ARMAMENTARIUM A-70

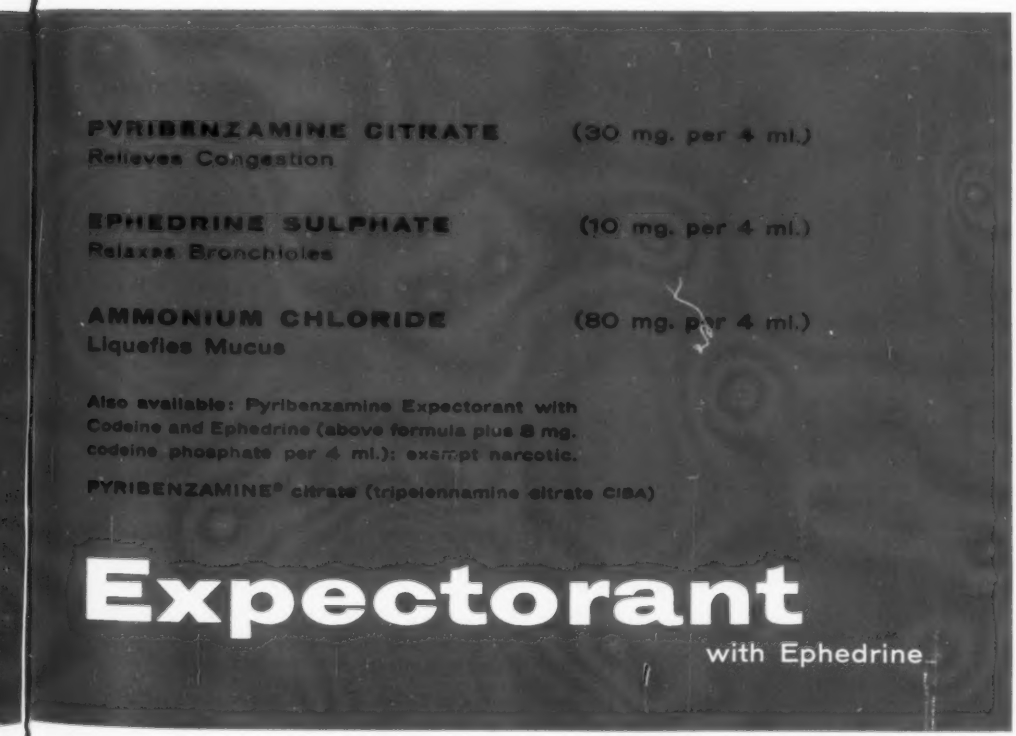
PRODUCTS BY THERAPY INDICATIONS A-85

THE MEDICAL MUSE. Richard Armour A-90

THE MEDICAL BOOKMAN A-93

DR. PEPYS' PAGES. Morris Fishbein, M.D. A-114

INDEX TO TECHNICAL EXHIBITS A-122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FORTHCOMING FEATURES

IN Postgraduate Medicine

SPECIAL ARTICLES

Current Practices in the Diagnosis of Tuberculosis (Symposium)

DAVID T. CARR, M.D., FRANK D. MANN, M.D., JOHN R. McDONALD, M.D., LYLE A. WEED, M.D., COLIN B. HOLMAN, M.D. AND BRUCE E. DOUGLASS, M.D., Mayo Clinic and Mayo Foundation, Rochester, Minnesota

The Management of Acne Vulgaris

SAMUEL M. BLUEFARB, M.D., Northwestern University Medical School, Chicago

The Use of Hydrocortisone Locally in Gynecology

A. HURTIG, M.D., University of Ottawa School of Medicine, Ottawa

Adenomatous Polyps of the Rectum and Colon and Relationship to Adenocarcinoma

JAMES W. HAMILTON, M.D., PAUL KISNER, M.D. AND B. R. WALSKE, M.D., Veterans Administration Hospital, Lincoln, Nebraska

SCIENTIFIC EXHIBIT

Bronchogenic Carcinoma

ROBERT R. SHAW, M.D. AND DONALD L. PAULSON, M.D., University of Texas, Southwestern Medical School, Dallas

PEDIATRICS

Irregularities of Respiration in the Newborn

A. ROBERT BAUER, M.D. AND PHILIP J. HOWARD, M.D., Henry Ford Hospital, Detroit

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(HYDROCORTISONE *TERTIARY*-BUTYLACETATE, MERCK)

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HYDROCORTONE-T. B. A. is a very slightly soluble ester of hydrocortisone. Comparable dosage of this new ester produces a longer and more intense local anti-inflammatory effect than hydrocortisone acetate when injected into the synovial spaces. The duration of relief may be from two to ten times longer.

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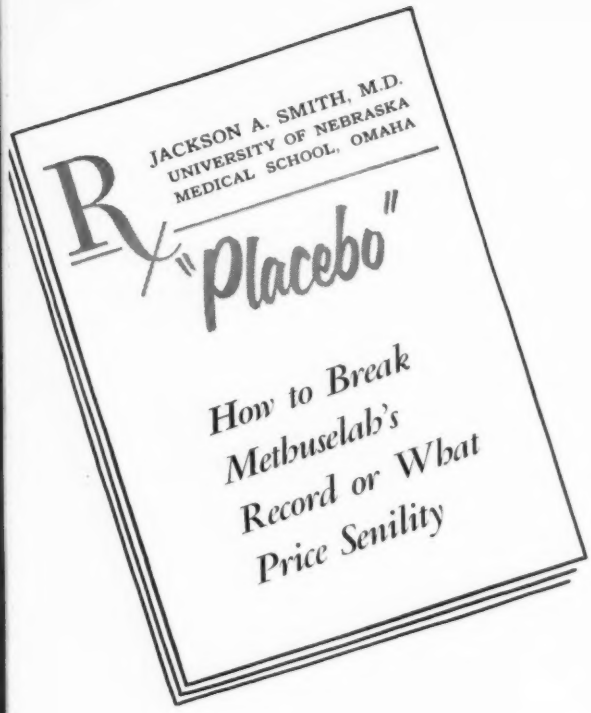

ABOUT the most hazardous thing a man can do these days is to get out of bed in the morning, that is if he wants to live to the ripe old age of, say, 45. However, if he does decide to throw covers and caution to the winds and risk a coronary by walking about, he can use his electric razor while bathing (provided his wife understands artificial respiration) and have a few more relaxed minutes with the front page obituaries in the morning paper.

If you hope to break even on your retirement plan and do a little time in the rocking chair on the front porch, you have to start the fight for senility with breakfast. No cream in the coffee or, better still, no coffee (just a big steaming cup of hot water—and watch out for esophageal strictures), no butter, and just enough skim milk ("blue John" to the farm boys) on your cereal to control your nausea, to keep your cholesterol down and your longevity up.

Unless you're a chimney sweep, your best bet for CA is to reach for a cigarette. The remarkable thing about cigarette smokers is that they live long enough to get CA. Unless you're born a woman or have been converted surgically, the statistical odds on your coronaries thrombosing, or your being struck by lightning or trampled by runaway horses are so much higher if you smoke that the CA should be a minor worry. Somehow, if you smoke you just won't show up for roll call very long.

The best way to stop smoking is at night; then you can resume in the morning. Of course, if you're really serious and do quit, the first two or three years are the worst. To break the habit, it is best to substitute some milder drug—say morphine or heroin; no one ever gets CA from these.

To reach senility safely you must not worry. If you lose your office or your house burns, just laugh it off. (Of course, if you laugh it off too loudly one of your friends may swear out a lunacy complaint, but that beats worrying.) It is generally agreed that there is no illness which emotional strain won't cause—ulcers (gastric or varicose), high, low and medium-rare blood pressure, and pinworms. Particularly pinworms, since if you hadn't been biting your nails in the first place you wouldn't have gotten the pinworms, and anyone who bites his nails is just about ready for a "wonder drug" anyway.

It's finally becoming obvious that all disease is psychosomatic, since if it doesn't involve either the psyche or the soma it's a rare syndrome indeed. After you've conquered worry, which should require only 50 years or so, the next thing to rule out is anger. Particularly when you arrive at the hospital to make rounds and every space in the doctors' parking lot is filled with visitors' cars, just smile and park three blocks away and enjoy the brisk walk back, even though you feel like parking in the superintendent's office. Also, at 9:00 P.M. when you've finally finished rounds and are anxious to get to your mortgaged home and dinner, if the hospital elevator passes you by a couple of times, don't try to butt the door in with your head, just sit quietly on the floor, smile and relax. Surgeons seem to have the most trouble with temper. You hardly ever see one who can laugh very loudly when someone contaminates him and he has to scrub over, or when an assistant absent-mindedly nicks an aorta. Oddly enough though, they live longer than average—probably because they don't smoke.

(Continued on page A-20)

Two articles in the April 30th issue of The Journal of the AMA [1,2] report on . . .

an entirely new type of tranquilizer with muscle relaxant action— orally effective in

THE MILTOWN MOLECULE

ANXIETY, TENSION and MENTAL STRESS

- a completely new drug developed through original research by Wallace Laboratories
- not related to reserpine or other tranquilizers
- no autonomic side effects
- selectively affects the thalamus
- well tolerated, not habit forming, effective within 30 minutes for a period of 6 hours
- supplied in 400 mg. tablets. Usual dose: 1 or 2 tablets— 3 times a day

1. Selling, L. S.: J.A.M.A. **157:** 1594, 1955.
2. Borrus, J. C.: J.A.M.A. **157:** 1596, 1955.

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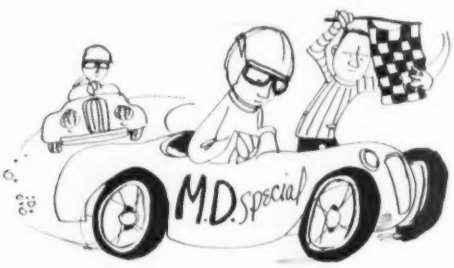
LITERATURE AND SAMPLES AVAILABLE ON REQUEST

Psychiatrists, on the other hand, seem to have the most trouble reaching senility, but they understand why they die, so it's no problem.

Finally, to survive you must be regular—from sigmoid up. Keep a schedule and don't let anyone interrupt it. The nurse in the E.R. at 3:00 A.M. may have a little trouble grasping the idea, as will the office patients when you walk off and leave them at 5:00 P.M., but if you stick to your schedule it won't be long before the patients quit bothering you and you'll have plenty of time for a hobby.



Besides, it's a known fact that no doctor can live past 30 without a hobby. Work in your yard any afternoon that the temperature is over 100°, race sports cars and keep a few buzz saws in your basement. Your neighbors may jokingly complain about the noise from your buzz saws, but until they get an injunction you have no cause for worry.

There's one bit of scientific reporting that should be good news to all, particularly the drunken driver, and that's the fact that you can't become intoxicated on beer (not root beer, real beer); but to offset this good cheer there's another report that with more than two drinks you start chipping off your cortex. So, by the time you're 40, if you don't watch it, you'll be a spinal animal.

It's obvious that Methuselah didn't drink or smoke, worry or fret, and was regular, but how did he make it without a hobby?

In conclusion, an old ivy-covered joke is worth repeating; it's about the doctor ticking off a long list of "don'ts" to the patient, including don't smoke, don't drink, etc., only to have the patient ask, "Doctor, if I don't do all those things will I live longer?" And the doctor replied without hesitation, "I don't know whether you'll live any longer, but you can be sure of one thing—it'll seem a whole lot longer."

Complaints in elderly "Diminished in number"

Harris found that the effect of oral reserpine (Serpasil) was to diminish complaints typical of elderly people not in the best of health. The majority of 26 patients studied expressed a feeling of well-being and appeared calmer; there was also less difficulty in sleeping.

A convenient, geriatric dosage form—Serpasil Elixir—is now available.

Harris, R.: Ann. New York Acad. Sc. 59:95 (April 30) 1954.

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Serpasil tranquilizer-antihypertensive

IN ALL CASES OF HYPERTENSION premedication with Serpasil smooths the way to the unaccustomed milieu of lower pressure. Serpasil tranquilizes the patient, shields him from psychic stress; Serpasil usually prevents the side effects often associated with potent antihypertensives such as Apresoline.

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Your Questions answered

Readers may send questions from their own practice or other medical problems which will be answered by qualified consultants. Replies are forwarded by mail immediately and selected questions and answers are published each month in this section.

• HABITUAL ABORTION

Q. In treating habitual abortion with progesterone, is progesterone in oil better than aqueous progesterone; e.g., about 25 mg. is given two to three times weekly.

M.D.—Ontario

A. In the use of progesterone we prefer the preparation in oil to the aqueous solution. This allows for somewhat longer medication as the absorption is more delayed. We have felt, too, that anything less than 100 mg. per day is hardly worth giving. It takes at least this amount to affect the level of pregnanediol as recovered in the urine.

We feel strongly that progesterone should not be administered after bleeding of threatened abortion has once begun. In the treatment of habitual abortion before bleeding has started, it may have merit. The proof concerning its merit, however, is not conclusive.

• KIDNEY STONES

Q. A 26 year old married woman, over a period of about seven weeks, has passed 69 kidney stones—22 from the right and 47 from the left kidney. In your opinion is this not a rather outstanding case? As yet, no x-ray studies have been made.

M.D.—Connecticut

A. This is an outstanding case as reported, but it might not be so if a thorough clinical examination were made by well-trained urologists. If you desire to report this case as outstanding, I would make the following suggestions:

1. A thorough urologic examination, including x-ray and retrograde pyelograms.
2. Chemical analysis of the stone.
3. Check the patient's habits and background. The last case of this nature I followed required several months of careful examination and re-examination before I discovered that the patient was a malingerer who was having trouble with her husband and was bringing in a handful of stones from her gravel walk whenever she wished.
4. Be careful to examine the patient for hypoparathyroidism. There are certain inborn errors of metabolism that could cause this condition.

Many patients with conditions of this nature are bedridden as a result of poliomyelitis or fractures of the spine. They form stones continuously during the repair of bone and/or because of the recumbent position which they are required to assume during convalescence.

• VITILIGO

Q. What is your evaluation of the new drug (8-Methoxysorolen) in the treatment of vitiligo?

M.D.—Montana

A. Results in the use of this preparation in the treatment of vitiligo are encouraging. A number of reports on studies made by various investigators indicate that repigmentation results in a fairly high percentage of patients on whom this drug has been used.

(Continued on page A-26)

the drug of choice

. . . as a tranquilizing (ataractic) agent in anxiety and tension states*

. . . in hypertension

RAUDIXIN

Squibb Whole Root Rauwolfia

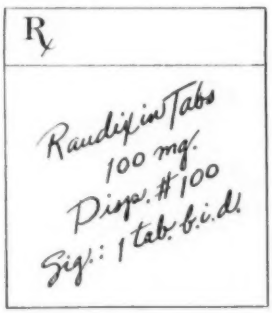
As a tranquilizing agent in office practice, Raudixin produces a calming effect, usually free of lethargy and hangover and without the loss of alertness often associated with barbiturate sedation. It does not significantly lower the blood pressure of normotensive patients.

In hypertension, Raudixin produces a gradual, sustained lowering of blood pressure. In addition, its mild bradycardic effect helps reduce the work load of the heart.

- **Less likely to produce depression**
- **Less likely to produce Parkinson-like symptoms**
- **Causes no liver dysfunction**
- **No serial blood counts necessary during maintenance therapy**

- Raudixin is not habit-forming; the hazard of overdosage is virtually absent. Tolerance and cumulation have not been reported.
- Raudixin supplies the *total* activity of the whole rauwolfia root, accurately standardized by a rigorous series of test methods. The total activity of Raudixin is not accounted for by its reserpine content alone.

Supply: 50 mg. and 100 mg. tablets, bottles of 100 and 1000.



*Ataractic, from ataraxia: calmness untroubled by mental or emotional excitation. (Use of term suggested by Dr. Howard Fabing at a recent meeting of the American Psychiatric Association.)

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"RAUDIXIN"® IS A SQUIBB TRADEMARK

IN CORTICOID-TREATED PATIENTS

minimize adrenal suppression and atrophy

BY THE REGULAR PERIODIC USE OF

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Stress of surgery, accidents or infections is magnified in patients treated with cortisone, hydrocortisone, prednisone or prednisolone. Adrenal steroids, even in small doses, jeopardize the defense mechanism against stress by causing adrenal cortical atrophy. Concomitant use of HP*ACTHAR *Gel* counteracts adrenal atrophy by its stimulant action on the adrenal cortex.

Dosage recommendations for supportive HP*ACTHAR *Gel* are, inject:

1 a. 100 to 120 U. of HP*ACTHAR *Gel* for every 100 mg. of prednisone or prednisolone.

b. 100 U. of HP*ACTHAR *Gel* for every 200 to 300 mg. of hydrocortisone.

c. 100 U. of HP*ACTHAR *Gel* for every 400 mg. of cortisone.

2 Discontinue use of steroid on the day of injection.

*Highly Purified. HP*ACTHAR *Gel* is The Armour Laboratories brand of purified corticotropin.

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The exact mechanism of action of psoralen derivatives is not known. The drug is well tolerated by most patients, but it is felt that liver function tests should be made throughout the course of treatment as there are some patients who will show abnormal tests, indicating toxicity and interdicting further oral administration of the drug.

The cooperation of the patient is most important in obtaining good results, as it is essential that the patient be exposed to sunlight in sufficient amounts to produce tanning in order to obtain results with the drug.

I believe this drug offers some new hope to the patient with vitiligo.

• RADIATION AFTER MASTECTOMY

Q. A 56 year old white woman underwent a radical left mastectomy about three years ago for a scirrhous carcinoma. The microscopic examination showed involvement of several retromammary and axillary lymph nodes, many of which were fibrous. No other metastases were found. She received x-ray therapy after the operation but the exact amount is unknown.

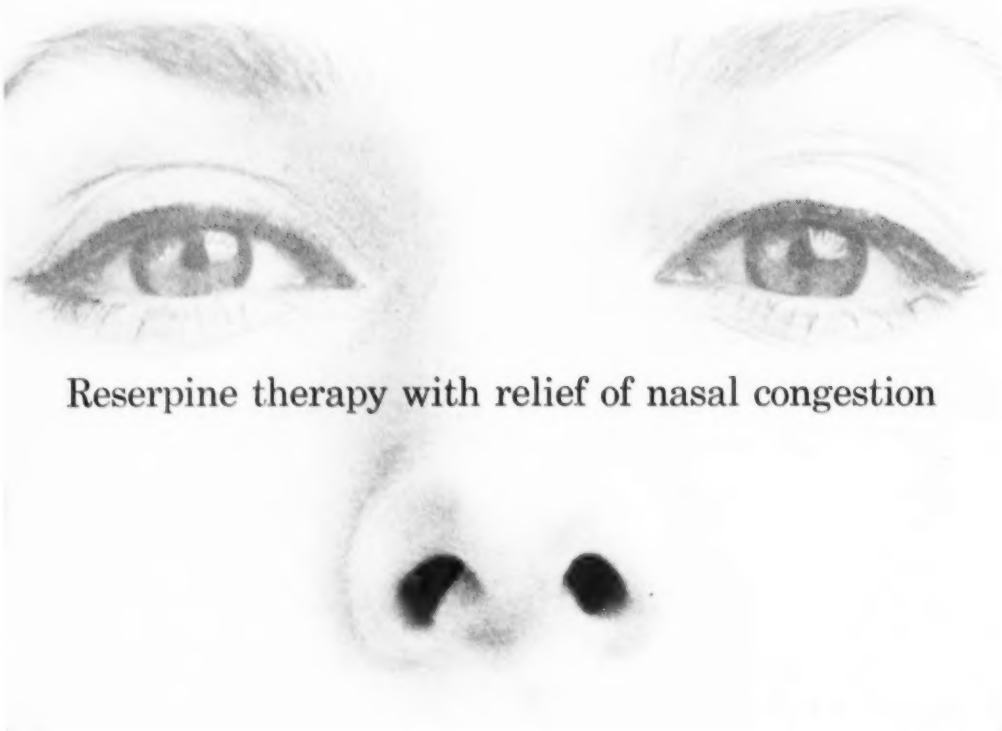
She did very well until three months ago when she noticed a lump located anteriorly over one of the ribs near the scar of the incision. She was operated on and a fragment of the chest wall and two ribs were removed. Between the ribs and the skin there was a fairly well-demarcated mass that measured 3.5 by 3.5 by 1.5 cm. A cut section revealed no continuity between the base of the tumor and the periosteum. There was infiltration of the anterior fibers of the intercostal musculature but the posterior fibers were free of malignant cells. Exploration of the mediastinum and adjacent areas did not show any involvement. Pleura and lungs were clear.

Should postoperative radiation be given and how much? What is the prognosis and what other treatment and follow-up, if any, do you suggest?

M.D.—Puerto Rico

A. Postradiation with portals covering generously the area involved should be worthwhile in order to prevent massive local recurrence.

A dose of 3000 r is suggested if the postoperative x-ray treatment previously given did not involve that area. If it is within the area previously treated with x-ray, I would limit the dose to 2000 r.



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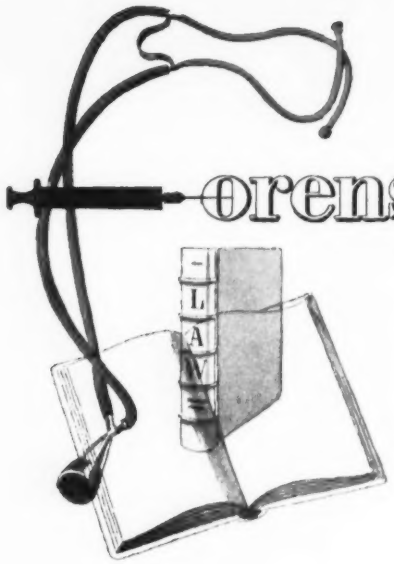

Forensic Medicine

Editors

Dr. Thomas A. Gonzales
Dr. Milton Helpern
Dr. Samuel A. Levinson

Tumor and Trauma

PHILIPP R. REZEK*

University of Miami School of Medicine, Miami

I BELIEVE I can convey the importance of this subject to the practitioner by reporting a case in the form of an *expertise*. I am grateful to the Maryland Casualty Company for permission to publish and analyze such a case.

PHILIPP R. REZEK

A 60 year old woman received a single blow to her large toe, causing a wound which did not heal. About three months later, biopsy disclosed the presence of cancer, presumably at the site of trauma. Seven weeks following this disclosure, an enlarged inguinal gland was removed from the same side and found to be cancerous.

My opinion was sought regarding a direct relationship between the trauma and the development of cancer—whether or not the cancer was present prior to the injury and whether or not it was aggravated or accelerated by the trauma.

The representative of the insurance company requested that I summarize the problem of trauma and its relation to tumor, both generally and in regard to its special implications in this case.

I shall describe as briefly and simply as possible the basic theory of cancer, particularly with regard to its relationship to trauma and the significance of this relationship, evaluating these points by drawing from my personal experience and referring to the literature.

In the field of tumor pathology, a large number of articles are concerned with the question of whether or not trauma can produce a tumor. In pathogenic analysis there is scarcely a realm in which the phrase *post hoc, ergo propter hoc* is a greater enigma or of greater importance.

According to Moritz, there are three reasons why, in numerous cases, a relationship between trauma and tumor is assumed: (1) There is no satisfactory explanation for the development of a tumor, especially if it occurs at the site of a previous injury; (2) mechanical injury often is held responsible for tumor development because of the frequency of such injuries. Many persons sustain so many injuries during their lives that, according to the laws of chance, injury will be succeeded by tumor formation in many instances quite independently of any cause-and-effect relationship; (3) many persons with malignant tu-

(Continued on page A-36)

*Department of Pathology, University of Miami School of Medicine; Pathology Laboratories, Jackson Memorial Hospital, Miami, Florida.

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References

1. Morrow, R. L., "Painless Proctology," Missouri Med., 52:705, September, 1955.
2. Peal, L., and Karp, M., "A New Surface Anesthetic Agent, Tronothane," Anesthesiology, 15:637, November, 1954.
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mors attribute the condition to some preceding trauma because they would receive insurance or workmen's compensation benefits if proved.

The proper approach to the problem lies in a discussion of the basic theory of cancer; the working hypothesis used is unimportant so long as it is sound and practical.

Dietrich has stated that tumor development depends on the following factors: (1) the local tumor anlage or tumor blastema. The latter being congenital tissue, heterotopia may be the origin of tumor development. According to Fischer-Wasels, the origin of a tumor also may be traced to faulty regeneration; (2) a general tumor predisposition which, based on different general endogenous factors, cannot be defined; (3) an inducing factor—mechanical, thermal, electromagnetic or chemical—which leads to somatic mutation of a cell, which in turn leads to successive autonomous growth.

Thus a tumor is the result of several factors, including local predisposition or tendency and the inducing action of an injury.

If trauma is to have a cancerogenic effect, a local or general predisposition is necessary. Otherwise, all persons exposed to trauma, mechanical or otherwise (miners, aniline workers, etc.), would have cancer. This also was proved by experience in both world wars. True, the literature contains reports of cases in which tumors developed at the sites of war injuries (bullet or shell fragment wounds, etc.), but they are so few that this again proves the aforementioned postulation.

Dietrich's investigations demonstrated how few tumors were related to war injuries during World War I—only 40 cases of neoplasms in 5,000,000 injuries. A similar picture became apparent after World War II. Only a few observations of cancer developing at the site of bullet wounds or scars have been published. The same applies to civilian life. According to Moritz and based on statistics of the National Safety Council, 8,000,000 to 10,000,000 disabling traumatic injuries occur annually in the United States, in addition to millions of nondisabling injuries. Taking into account that about 150,000 persons die of cancer in the United States annually, we must agree with Moritz's statement that metastasis or tumor may develop by chance or coincidence at the site of a previous injury, but that, under certain circumstances, such an incident also may *cause* a tumor.

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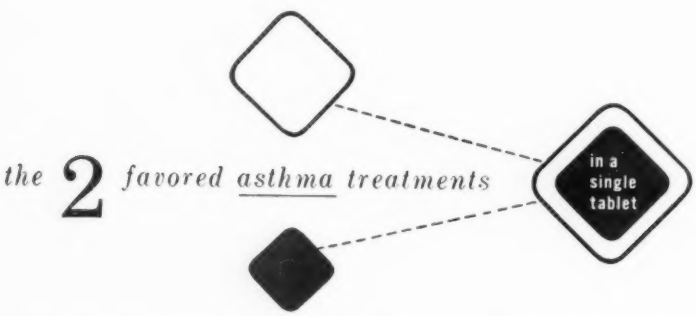

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1. Roff, J. D.: Personal communication.

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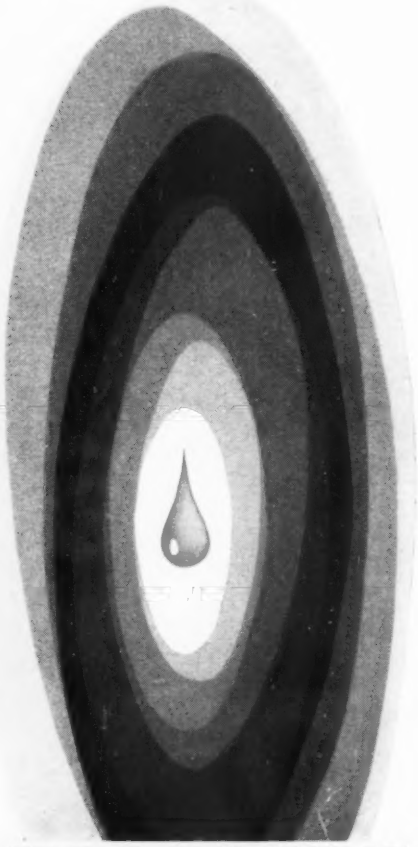

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Two points made by Moritz must be emphasized: (1) Development of a tumor after trauma is not necessarily an indication of a cause-and-effect relationship, and (2) there is a striking comparison between the incidence of malignant tumors among previously injured persons and that of malignant tumors among noninjured persons. For further study I recommend the papers by Lewi, Wainwright, Parker and Kernohan.

Statements which apply to the case covered in this discussion have been made by Lazarus-Barlow and Schreck. The former has written that relatively few malignant tumors develop in regions of the body most frequently affected by mechanical injury. In less than 1 per cent of 10,000 cases of malignant neoplasms of the trunk or extremities was such a connection demonstrated. Schreck found that 2.8 per cent of 457 tumors developed in pre-existing scars, most of them on the skin. But in 10 of those 13 cases he was dealing with "scar carcinomas." This led him to conclude that on rare occasions cancer may develop at the site of a long-standing, unhealed wound of the skin.

Busch recently reported two interesting cases. The patients were wounded while on active duty during the first world war. In the first, a shell fragment injury in the anal region subsequently developed into an anal fistula and finally an adenocarcinoma. The second patient received a bullet wound which produced sequestration of the bone followed by a malignant synovioma at the site of injury. In both cases, tumor developed many years after the original injury.

Ebert has reported three cases, the first of which concerned a 52 year old man who received multiple splinter injuries of soft tissues early in the second world war. Eight years later a polymorphous sarcoma developed at the site of injury. The second case was that of a 32 year old man whose upper arm was fractured by a bullet wound during World War II. Eight years later a spindle cell sarcoma of the soft parts developed at the site of injury. The third patient, a 65 year old man, received severe shell wounds in World War I, necessitating amputation of a limb. Thirty-seven years later a neurofibrosarcoma developed in the area where his prosthesis pressed on the tissues.

Graber and Kuester reported two cases. Sarcoma and fatal metastases developed two and one-half years after injury in the first case, that of a man wounded in the left cheek by a bullet

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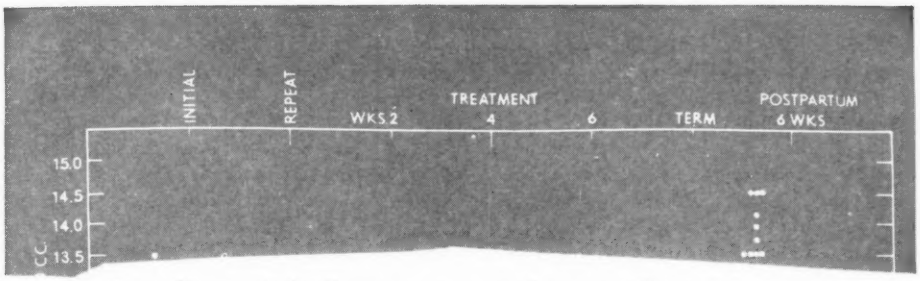
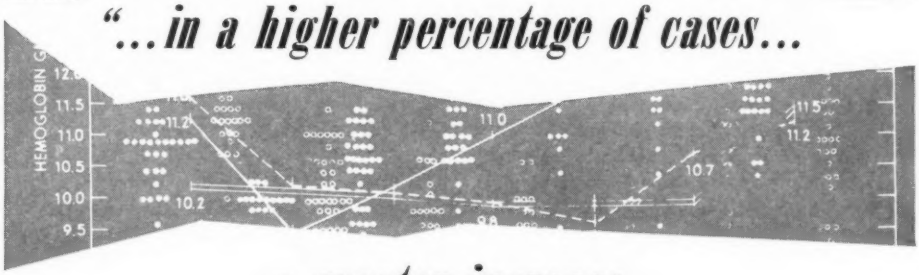
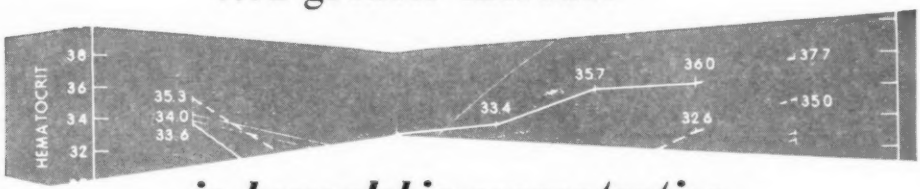


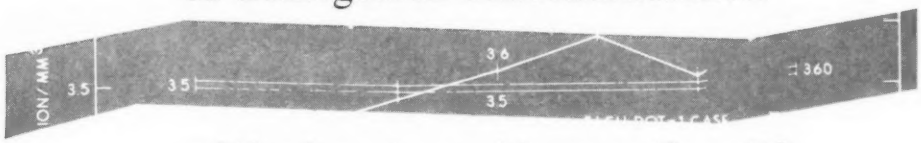
"...in a higher percentage of cases...



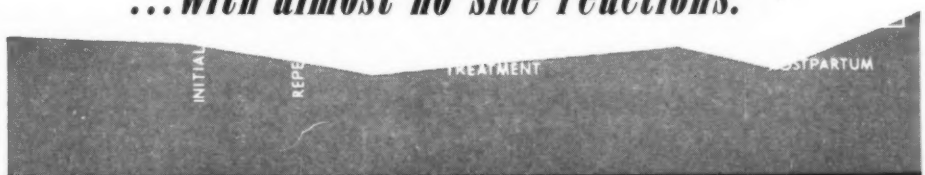
...a greater increase



in hemoglobin concentration...



*...with almost no side reactions."**



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during World War II. This case was of special interest because the bullet wound healed poorly even after removal of two foreign bodies from the wound bed. Two years later the wound site became indurated, and histologic examination revealed basal cell carcinoma. X-ray treatment improved the situation locally. Subsequently, however, the patient had severe headaches, diagnosed as trigeminal neuralgia, which did not cease in spite of exeresis of the first branch of the trigeminal nerve and later of the gasserian ganglion. By November 1948 a tumor recurred on the left cheek at the site of the previous injury. Biopsy disclosed a polymorphous, predominantly spindle cell sarcoma with numerous mitoses. Mandibular resection and enucleation of the left eye did not control the growth, and the patient died three and one-half years after his initial injury. Autopsy revealed involvement of the hypopharynx and palate and numerous metastases to distant organs from a tumor diagnosed histologically as sarcoma.

Graber and Kuester's second case concerned a 35 year old man who suffered a burn of the dorsum of the right hand in 1919. After many breakdowns of the wound, healing occurred. After a 31 year latent period, squamous cell carcinoma developed at the burn site. The hand was amputated after other treatment failed.

So far, I have tried to show that tumors may develop at the sites of previous injuries provided that there is a local and general predisposition to tumor development, that there are bridging symptoms such as irritation between the time of injury and occurrence of the tumor and, finally, that a certain length of time has elapsed between trauma and tumor.

The time element and the bridging symptoms are closely related, not only in regard to the problem of tumor and trauma but also, and particularly, to experimental cancer research. Granted that cancer can be produced experimentally with almost 100 per cent success in certain animals under certain conditions and with certain means, which can be termed carcinogenic agents, the fact remains that dosage and time are of greatest importance. The stimulus exerted by a carcinogenic agent (chemical, x-ray, etc.) must act for a certain length of time and with a certain strength and must be directed to the same place to produce cancer. According to Graber and Kuester, who follow the theory of mutation coupled with the theory of dispersion

(Continued on page A-44)

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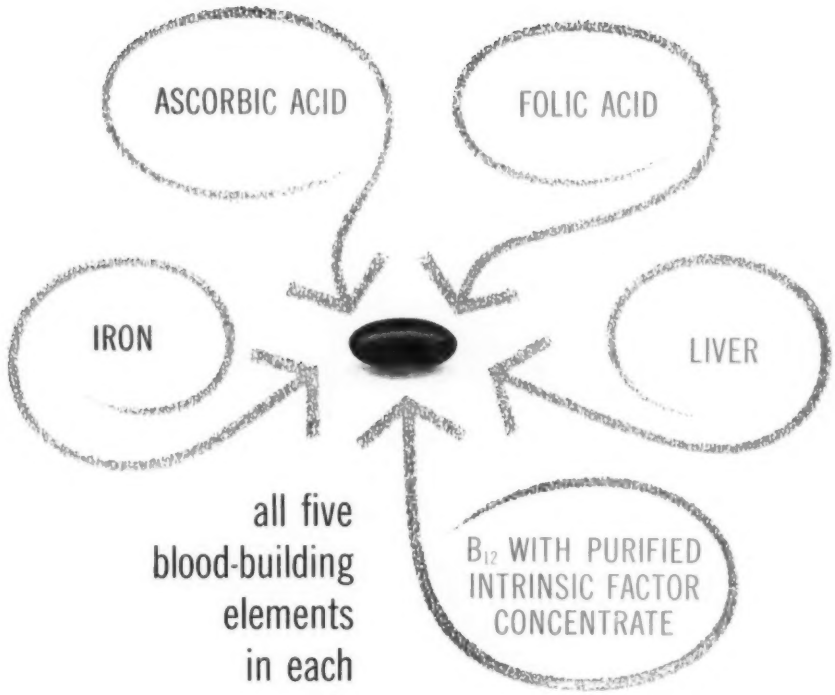

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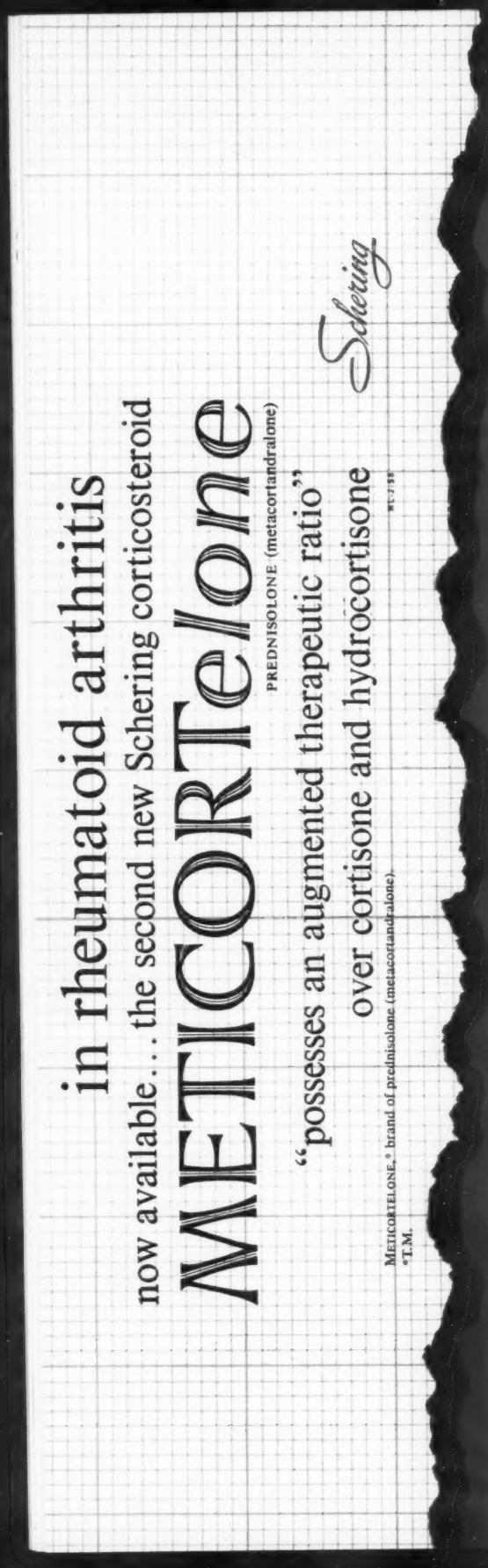

and hit, there is but one chance that "one electron will hit the bull's eye," and will then accomplish the essential change of gene which in turn leads to formation of irreversible cancer.

Formation of cancer, therefore, follows a statistical law of probability and also, to a large extent, the laws of Planck's quantum theory. Expressed somewhat differently, the stimulus exerted by the cancerogenic agent *may* lead to development of cancer but this is not necessarily the case. However, once the carcinogenic agent has accomplished the somatic (cancer) mutation, further development of the tumor follows the all or none law (Bowditch's law), which means that further growth cannot be stopped.

According to Butenandt, the formation of cancer from noncancerous cells is a basic biologic phenomenon. Obviously this process requires time. Moritz believes that a particularly active carcinogenic agent, such as benzpyrene, must operate for a period of one-third to one-fifth of an animal's life span before a tumor develops. If this were strictly applied to human situations, the potential relationship between trauma and tumor would be a still more remote possibility than it actually is. In other words, a latent period of several decades or at least several years would be necessary for cancer to be traumatogenic. With an interval, then, of only a few weeks or months, trauma must be repudiated as a causal agent.

Assuming a sufficient time lapse in any particular case, we must know how it would be possible for trauma to form the basis of tumor development. Trauma produces an internal or external wound into which, later on, detached pieces of tissue, necrotic material or foreign bodies may be deposited. These deposits, together with the possible continued presence of a carcinogenic stimulus, may cause mechanical and chemical irritation which leads first to inflammation and then to regeneration in the surrounding healthy tissue. In such a regenerating area, somatic mutation together with the development into cancer (faulty regeneration, according to Fischer-Wasels) is a remote possibility for nonexperimental cancers. Hence it is not the trauma itself which incites mutation; the trauma only prepares an area for mutation which finally culminates in cancer.

Trauma also may release growth in a silent tumor anlage, a common example being pigmented nevi, which may become malignant under

(Continued on page A-46)

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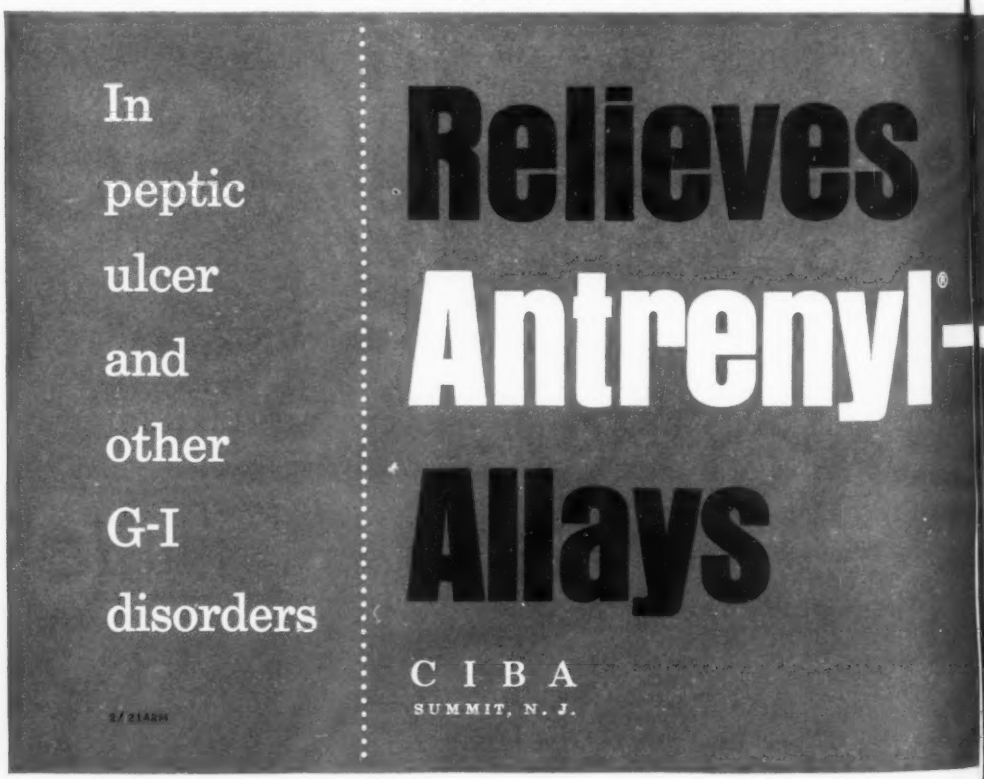
the influence of different types of trauma, including mechanical. Drugs and ointments applied to poorly healing wounds may provide the basis for these irritations or bridging symptoms. According to Graber and Kuester, these steady irritations or bridging symptoms are clues to the understanding of traumatogenic tumors. Medication and ointments may represent agents which, according to Bauer, whose mutation theory of cancer is our working hypothesis, act as carcinogenic factors. Druckrey supports Bauer's view, claiming that the mechanism by which carcinogenic substances become effective is based on their quality of "poisons potent by summation." These experiences also explain the length of the latent period.

While cancer may be produced experimentally by different means, as yet no one has been able to produce cancer in *normal* tissue by a single mechanical blow. However, *diseased* tissue has greater susceptibility to damage from mechanical injury. In other words, mechanical trauma which would *not* damage normal tissue *would* damage diseased tissue. This is of practical importance because such diseased tissue may consist of pre-existing tumor which becomes evident only after trauma. Likewise, a single mechanical blow or fall may lead to detection of breast, testicular, bone or even brain tumor. This phenomenon, called "traumatic determinism" by Ewing, is well known to surgeons and constitutes the basis for many claims for compensation. Therefore, one must analyze each case individually.

To exclude the possibility of a pre-existing tumor, one should follow the requirements stated by Mock and Ellis: "(1) Definite description by the reporting surgeon of the trauma at the time it was sustained; (2) definite proof by every possible means of examination at the time the injury was sustained that no tumor already existed at the time of the trauma; (3) definite signs and symptoms of a pathological process continuing at the site of the trauma until a malignant tumor appeared and was positively diagnosed."

In my experience, the second point often is difficult to prove, because a pre-existing tumor may be exceedingly small and therefore escape detection before or even after the trauma. (This is often the case with small subungual nevi.)

To summarize this portion of the discussion of the relationship between trauma and tumor, I may say that, according to Knox, there is no reasonable evidence of any relationship between a single injury and the production of cancer. I



also agree with Moritz that "the assertion that any given tumor was caused by a single mechanical injury would be unjustifiable unless it could be shown that the injury was responsible for prolonged chemical or mechanical irritation."

While the prerequisites for a positive relationship between trauma and tumor mentioned so far may be somewhat difficult to interpret, the others are more or less self-explanatory and can be simply enumerated. Segond, Thieme, Fischer-Wasels, Ewing, Koelsch, Knox, Mock and Ellis, Moritz, Dietrich, Bauer, Graber and Kuester, Rezek and many others, partly in cooperation and partly independently, list the following essential conditions for a causal connection between tumor and trauma:

1. Authenticity and certainty of trauma.
2. Adequacy of trauma (it need not be severe but has to be a permanent, steady irritation).
3. Identical site of trauma and location of tumor.
4. Adequate diagnosis of the tumor (evaluation both clinically and by any other means necessary with respect to pattern, malignancy, location, dissemination, etc.).
5. Elimination of the possibility of pre-existent tumor or disease in the traumatized area.
6. Sufficient time lapse between trauma and tumor development—at least one year, in accordance with general research experience.
7. Bridging symptoms during the latent period (irritation, foreign-body reaction, etc.).

I have tried to demonstrate how rarely one can establish a relationship between trauma and neoplasm, especially if the primary trauma was inflicted by a single mechanical blow to an area not involved by pre-existing disease or tumor. However, it is of paramount importance to emphasize the possibility that a pre-existing lesion (neoplastic or non-neoplastic and, if neoplastic, benign or malignant) may change its pattern, speed of growth and maturity if exposed to trauma, even a single mechanical blow. Here the time element is of less importance. In my experience and also in that of Moritz, the question of mechanical injury accelerating the growth of a pre-existing tumor is raised frequently, and compensation often is granted. That a so-called "silent" brain tumor, not producing clinical symptoms, may prove fatal due to hemorrhage following a single blow or fall may be important not only in compensation claims but also in criminal court as an extenuating circumstance.

(Continued on page A-48)

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According to Lubarsch, Marsh and others, experiments do not provide evidence that a single blow may activate a latent tumor or cause an already growing tumor to progress more rapidly. On the basis of clinical experience, however, one must admit that pre-existing lesions such as certain brain tumors, benign and malignant melanomas and osteogenic sarcomas change their speed of growth and pattern if removed incompletely, although Helwig, on the basis of biopsy investigation, repudiates this. With regard to the incomplete removal of such tumors, the outcome of the case will depend mainly on the type of tumor. Also, I would like to add that, regarding Helwig's repudiation, the biopsy specimen either contains the whole tumor or the procedure is followed closely by its complete removal. We must realize, however, that intermittent pressure on or massage of a tumor definitely may increase metastatic spread. Marsh, Tyzzer and Knox have demonstrated this in animal experiments. Medicolegal observations expressed by Moritz bear this out and my own experience confirms it.

Before rendering an opinion on the case to be evaluated, I shall describe briefly several of my own cases which demonstrate the rare connection between trauma and tumor.

Case 1—Several years ago I reported, with Fleming, a case of primary sarcoma of the skin which had developed in an old burn scar. About two decades had elapsed between the time of injury and the appearance of the tumor. The tumor was diagnosed as a mixed cell sarcoma and the patient died of metastases. The case met all the previously mentioned requirements and would not have warranted publication had it been a squamous cell carcinoma developing in an old burn scar, a relatively frequent occurrence. At the time of its publication, it was the first sarcoma described in a burn scar.

Case 2—During World War I, a 53 year old man had fallen against a machine gun and injured his right temple. He had paid little attention to the accident and remembered only a small contusion. Many years later he noticed a small, wartlike tumor at the same site. On questioning, he admitted that the sidepiece of his glasses rubbed continuously against the old scar. The tumor grew, and became fixed and adherent to the skin. Histologic examination disclosed neurogenic fibrosarcoma. When the patient was last seen four years ago, there were no signs of recurrence. This case meets all seven requirements for demonstrating relationship between trauma and tumor.

Case 3—A 53 year old woman first seen in May 1940 complained of a tumor on her right forearm above the wrist, and spontaneously asserted that it had developed in the same area which her child had gnawed consistently several years before. Biopsy revealed a mixed cell sarcoma, predominantly spindle cell. Removal of the tumor was incomplete, as gross infiltration into muscle tissue already was apparent. Histologic diagnosis was reconfirmed. The patient refused amputation and died following the development of massive lung metastases, diagnosed by x-ray. Autopsy was refused.

Case 4—A 49 year old fireman was admitted to the hospital on June 7, 1940, with a provisional diagnosis of tumor at the dome of the skull. About a year previously, he was accidentally struck at this site by a baseball bat. Several months before admission he noticed a slowly growing tumor mass, which was nonpulsating and painless, at the site of the injury. On questioning, he admitted that he could not avoid this area when combing his hair. Biopsy disclosed fibrosarcoma which at operation was found to have invaded the bone. Several weeks later, pulmonary metastases developed and the patient died during a coronary attack. Autopsy revealed the same type of tumor in the metastatic lesions and also showed coronary obstruction by tumor emboli. The foramen ovale was patent, and it is highly possible that tumor particles entered the diploë during surgery and were carried away by the blood stream, causing the subsequent course of events.

Case 5—A woman about 69 years old noticed a rather rapidly growing tumor on her right instep. Her physician made the diagnosis of ganglion and, adhering to an old, outmoded method of treating these cases, covered the involved area with a towel and smashed the tumor with a wooden hammer. He later massaged the smashed area. After five weeks the swelling recurred and the patient coughed up bloody sputum. Histologic examination of a biopsy specimen taken from the instep disclosed a round cell sarcoma, and chest x-rays revealed typical snowball metastases in the lung. The patient died several weeks later. Autopsy was not performed.

In analyzing these five cases, it is obvious that the last one must be separated from the first four. Although the first four seem to meet all the requirements for a relationship between trauma and tumor, in none could the fifth point,

(Continued on page A-50)

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the elimination of pre-existing disease or tumor, be definitely established. While three patients claimed that tumor followed a single instance of trauma, in one case (sarcoma of the forearm) the tumor presumably was initiated by steady irritation, the child's gnawing. Bridging symptoms (irritations) and an adequate period of latency (from 1 to 23 years) were present in all of the first four cases. In all cases, tumor developed at the site of trauma and an adequate tumor diagnosis was made. None of the first four patients made claims for compensation.

The fifth case is of special interest. A pre-existing tumor was exposed to severe mechanical trauma followed by squeezing and massage. The case was investigated and compensation claimed. I was asked as an expert witness whether or not the mechanical insult was the causative agent in the development of the tumor. The question was answered in the negative. The pertinent question, which would have been answered in the affirmative, was not asked—whether or not the trauma hastened metastasis and death. In this particular instance the life expectancy would have been short, even in the absence of trauma, due to the type of tumor (round cell sarcoma).

To analyze the case which is the subject of this *expertise*, I find it appropriate to apply the seven stipulations mentioned previously.

1. Authenticity and certainty of trauma—Based on the patient's history and medical record, there is no doubt that she sustained trauma to her toenail, that it was broken, and that moderate hemorrhage followed.

2. Adequacy of trauma—This prerequisite is also met, inasmuch as the heavy blow resulted in a wound. Further, we cannot exclude succeeding irritation by mechanical means or by superimposed medical treatment.

3. Identical site of trauma and location of tumor—The affirmative answer to this point is based on medical records.

4. Adequate diagnosis of the tumor—Diagnosis was made by an extremely well-qualified and certified pathologist. He submitted the histologic slides to me, and I concurred basically with his diagnosis.

5. Elimination of the possibility of pre-existent tumor or disease—Despite the patient's statement that her toe was completely normal prior to the accident, one of her physicians reported the presence of a deformity of the little toe. Also, she had worn improperly fitting shoes over a long period. Although these statements do not indicate a large primary tumor, they do not rule out a so-called benign or malignant epithelioma of the skin or a small benign subungual nevus several millimeters in diameter which could become malignant as a result of trauma and irritation. It would also be important to learn what drugs or ointments the patient used for self-treatment before she consulted a physician (summation of carcinogenic agents?).

6. Sufficient time lapse between trauma and tumor development—at least one year—This prerequisite was not met.

7. Bridging symptoms during the latent period—Local interim symptoms were present during the latent period.

A slight discrepancy exists in this case between the histologic classification of the primary tumor and that of the removed lymph gland. The first was diagnosed as melanosarcoma, poorly differentiated squamous cell carcinoma or transitional cell carcinoma. The metastasis in the lymph gland was diagnosed as poorly differentiated squamous cell carcinoma. I personally favor the diagnosis of melanosarcoma (nonpigmented type) in both lesions. However, the type of tumor is basically not important, inasmuch as we are dealing with a poorly differentiated, rapidly growing malignant neoplasm. Also, from a clinical point of view, the diagnosis of melanosarcoma is more likely, because it is this type of tumor which, under the influence of trauma, is likely to accelerate in growth and become more malignant or change from benign to malignant. Furthermore, the co-occurrence of benign and malignant nevi under the toenail is not unusual. I have seen hundreds of cases of squamous cell carcinoma, but I have never seen one produce metastases to the regional lymph glands or other glands in such a short period of time.

The statements that general enlargement of the glands developed, with fever, and that prior to the femoral inguinal incision the lymph nodes were not enlarged indicate general spread.

Opinion—While I do not believe that the single mechanical insult alone was responsible for the development of this tumor, I do believe that pre-existing pathology, neoplastic or not, developed into neoplastic disease under the influence of the trauma. There is no doubt in my mind that the trauma accelerated a possible pre-existing growth, that it was responsible for the increased viciousness of the tumor and that it thereby was responsible for shortening the life expectancy.

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*Parish, F. A.: M. Times 83:870 (Sept.) 1955.

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The body of the newborn infant contains approximately 500 grams of protein, 14 grams of phosphorus, and 0.5 gram of iron.[3] It is estimated that the lactating mother, through breast milk, provides a 26 week old infant with about 12 grams of protein, 76 grams of lactose, and 1.2 mg. of iron each day.[2]

Pork meat, an excellent source of high quality protein, thiamine, niacin, and iron,[4] also supplies valuable amounts of other B vitamins, as well as phosphorus, magnesium, and potassium. The thiamine content of pork is particularly important, since there are few more valuable food sources of this vitamin.[4]

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1. Toverud, K.U.; Stearns, G., and Macy, I.G.: Maternal Nutrition and Child Health, an Interpretative Review, Washington, D.C., National Research Council, Bull. 123, 1950.

2. McLester, J.S., and Darby, W.J.: Nutrition and Diet in Health and Disease, ed. 6, Philadelphia, W.B. Saunders Company, 1952, p. 241.

3. Marrack, J.R.: Food and Planning, London, Victor Gollancz, Ltd., 1943, p. 67.

4. Wolgamot, I.H., and Fincher, L.J.: Pork Facts for Consumer Education, Washington, D.C., United States Department of Agriculture, AIB No. 109, 1954.

5. Watt, B.K., and Merrill, A.L.: Composition of Foods—Raw, Processed, Prepared, Washington, D.C., United States Department of Agriculture, Agricultural Handbook No. 8, 1950.

6. Bowes, A. deP., and Church, C.F.: Food Values of Portions Commonly Used, ed. 7, Philadelphia, Anna dePlanter Bowes, 1951.

Percentages of Recommended Daily Dietary Allowances* for Pregnant (3rd Trimester) and Lactating Women Provided by 3-Ounce Portions of Cooked Pork Meats and Pork Sausage

	Protein	Iron	Phosphorus	Thiamine	Riboflavin	Niacin	Calories
PREGNANCY (3rd trimester)							
Ham, without bone, 3 oz., cooked[5]	25.0%	17.3%	13.5%	30.0%	10.0%	26.7%	12.5%
Pork Chops, without bone, 3 oz., cooked[5]	25.0%	17.3%	13.3%	47.3%	10.0%	28.7%	10.5%
Pork Sausage, 3 oz., cooked[6]	17.3%	14.0%	9.2%	27.7%	10.1%	18.5%	14.7%
LACTATION							
Ham, without bone, 3 oz., cooked[5]	20.0%	17.3%	10.1%	30.0%	8.0%	26.7%	10.2%
Pork Chops, without bone, 3 oz., cooked[5]	20.0%	17.3%	10.0%	47.3%	8.0%	28.7%	8.6%
Pork Sausage, 3 oz., cooked[6]	13.8%	14.0%	6.9%	27.7%	8.1%	18.5%	12.0%

*Recommended Dietary Allowances, Washington, D. C., National Academy of Sciences—National Research Council, Publication 302, 1953

The nutritional statements made in this advertisement have been reviewed and found consistent with current medical opinion by the Council on Foods and Nutrition of the American Medical Association.

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Medicine from Abroad

FROM POSTGRADUATE MEDICINE'S CORRESPONDENTS

LONDON

Death of Lord Horder—Lord Horder, who died recently at his country home in Hampshire, at the age of 83, will be remembered as the "father of clinical pathology" in England—the physician who first brought the laboratory to the bedside. No major medical discovery is associated with his name, but for more than one generation he was the leading English consultant in internal medicine, the adviser of kings and statesmen, justly famous for his unusual skill in diagnosis, his common sense in treatment, his lack of conceit, his approachability, his friendliness, his independence, his puckish sense of humor. To the general public and the newspapers he was the favorite interpreter of the mysteries of medicine. He was president or chairman of societies and associations dealing with eugenics, birth control, noise control, venereal disease, rheumatism, health education, cancer research, smoke abatement and child guidance. He had, in fact, the reputation of liking to have his finger in every pie, which perhaps explains why the very conservative Royal College of Physicians never elected him as its president, as he would have liked and as should have been done.

"Glandular fever"—The past summer a curious infectious fever claimed many victims, although fortunately with no fatalities, in London. It was called "glandular fever" because of superficial resemblance to the well-known infectious mononucleosis. It is now believed to have been caused by a different and hitherto unknown virus. The infection almost uniformly began with high temperature, sore throat, swelling of the neck and axillary glands and disturbances of the nervous system—sometimes distorted vision, deafness or partial paralysis. Paul Burnell's test, however, was negative, and the temperature went up and down for a month or six weeks, followed by depression.

The outbreak began at Royal Free Hospital, where so many of the nursing staff were taken ill that the hospital had to close for several weeks. It is said that the first victim was an American woman who came to the hospital as a volunteer social worker. Many investigations have been made but so far with negative results, and the National Virus Reference Library has failed to identify the virus.

Varicose veins—The treatment of varicose

(Continued on page A-58)

"Complete to Excellent Control" of Seizures was Achieved with "Mysoline" in More than 50 per cent of Patients Previously Uncontrolled with Other Anticonvulsants.

Timberlake, Abbott, and Schwab* report "100 per cent control" with "Mysoline" in 22 patients and from "50 to 100 per cent control" in another 28, in a series of 96 patients with grand mal and psychomotor seizures.

Grand mal seizures were completely eliminated in 14 of 38 patients (4 receiving "Mysoline" alone), and in 9 the frequency of seizures was reduced by more than half. Two patients in *status epilepticus* were also brought under control with "Mysoline."

Psychomotor attacks were completely controlled in 6 of 37 patients, and in 12 (8 receiving "Mysoline" alone) the number of attacks was reduced by half or more.

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In general, "Mysoline" was well tolerated. No side effects occurred in 34 per cent of the patients. In other cases, side effects such as drowsiness, dizziness, and ataxia were frequently noted at the start of therapy but tended to disappear as therapy was continued.

To minimize side effects, these workers recommend small initial doses of "Mysoline," 0.125 Gm. (half tablet) daily, to be increased by 0.125 Gm. increments at three to seven day intervals.

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*Timberlake, W. H., Abbott, J. A., and Schwab, R. S.: New England J. Med. 252:304 (Feb. 24) 1955.

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veins today is still unsatisfactory, and the once-popular injection treatment has been very largely abandoned because the valves in the important communicating veins were found to be damaged by it. There have been no important advances in prevention, but the stripping operation has been revived in an improved form which gives better results than the older methods. Dr. Ian Fraser of Belfast, president of the Irish Royal College of Surgeons, pointed out recently (*The Practitioner*, September, p. 267) that the value of vein stripping is that it not only removes entirely the dilated subcutaneous veins but it also tears across the communicating veins which are the main cause of recurrence. The main points in technic are: (1) correct choice of vein extractor; the old rigid steel rod of Babcock has been replaced by a thin flexible wire with an acorn-shaped end that can be inserted down the most tortuous veins. (2) The operation must be done with the table acutely tilted, head down, so that there is little or no bleeding into the vein bed. (3) The extractor, having been inserted into the open end of the saphenous vein in the groin, is passed as far distally as possible. When the olivary end will go no farther, a transverse incision is made and the vein exposed. The lower end of the vein is then tied and the upper end is tied tightly around the vein extractor so that when the pull is exercised at the groin end the whole vein is pulled from below as a long thin tube telescoped on the instrument. If only 1 or 2 in. are pulled up at first, it is possible to do the final skin closure of the lower wound immediately. This means that when the vein is finally pulled up, the leg can at once be bandaged from ankle to groin so that the dreaded hematoma does not have a chance to appear. A few stitches in the groin wound complete the operation.

Cortisone or aspirin?—A second report has recently been published (*British Medical Journal*, September 17, p. 695) by the joint committee of the Medical Research Council and the Nuffield Foundation, under the chairmanship of the well-known physician, Sir Henry Cohen, on clinical trials of cortisone compared with aspirin in treating early cases of rheumatoid arthritis. Each patient of the 61 included in the trial (1) had a polyarthritis of rheumatoid type affecting at least four joints and bilateral involvement of either hands or feet, or ankles or wrists; (2) had had the disease for not less than three and not more than nine months, and (3) was between 17 and 59 years of age. Thirty of these patients were treated with cortisone and 31 with aspirin, the choice of treatment being made entirely at random. A preliminary report was made a year ago, and the present report extends the comparison to approximately two years from the beginning of treatment. X-ray films of the patients' hands and feet showed very little difference between the two groups with respect to porosis, but there was some excess of erosion in the aspirin group. The excess, however, was not more than might fairly easily arise by chance. Clinical assessment of the two groups showed no difference, and 14 of those on cortisone and 13 patients on aspirin were regarded as capable of doing their ordinary work and of taking normal physical recreation. At the end of two years, the report concludes, in no respect do the two groups differ by more than might easily be due to chance, and for practical purposes there is very little to choose between cortisone and aspirin for this type of patient.

AMSTERDAM

Myocarditis in newborns caused by the Coxsackie virus type B—As in 1951 and 1953, many cases of Bornholm disease were again observed in the Netherlands during the past summer. The disease is considered a benign infection which heals without sequelae, but the virus strain which caused the epidemic appears to be decidedly more aggressive this year. The virus was found in the feces of a noticeably large number of patients with serious meningitis much oftener than in 1951 and 1953.

More important, however, is the fact that Dr. F. Dekking of the University Laboratory of Bacteriology in Amsterdam has succeeded in culturing the virus from the heart of a newborn infant who died of myocarditis a few days after birth. The mother had had Bornholm disease shortly before the child was born. In Amsterdam even during the last few months a small number of newborn infants have died of myocarditis, a rare occurrence in other years.

It seems possible that the pathogenicity of the Coxsackie viruses, discovered as recently as 1948, is greater than was originally supposed.

(Continued on page A-60)

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Congenital anomalies and hypometabolism—Dr. J. Bos (Rotterdam) has reported the case of a woman who had, in succession, six miscarriages and two children with congenital anomalies. One child was anencephalic and the other began vomiting five days after birth. This child was operated on and a pyloric anomaly was found. The child died two days later. It was found that the mother's basal metabolic rate was considerably lowered (–13.5 per cent), and she was treated with Thyranon during later pregnancies. She subsequently gave birth to five healthy children. However, the eldest of these at the age of thirteen developed an adipositas, which was caused by insufficiency of the hypophysis (probably congenital). One of the mother's sisters had a miscarriage and also a baby with hydrocephalus. The sister's basal metabolic rate was found to be –14 per cent. Following therapy with Thyranon a normal child was born. Another sister, also with a lowered basal metabolism, had two children with congenital anomalies (pseudoglioma and spina bifida combined with hydrocephalus). A sister whose basal metabolism was normal had two healthy children. (Nederl. tijdschr. v. geneesk. 99:214, 1955.)

Many patients similar to these have been described, particularly in regions where goiter is endemic. Experimental investigations on animals were considered advisable to follow up the observations described. Dr. J. Langman and F. van Faassen studied white rats which showed no congenital malformations. The thyroid glands were extirpated before pregnancy. Basal metabolic rates were determined before and after surgery, as well as during pregnancy. The control and the experimental rats were killed on the twentieth day of pregnancy, the uterus immediately removed and the embryos examined.

The animals which had been operated on showed a smaller number of embryos per pregnancy. There was a high percentage of resorptions; ossification was retarded and sometimes abnormal; there were some cases of cleft palate and harelip, and hemorrhages from the jaws and hind legs. All degrees of degenerative symptoms were found in the lenses. There were several cases of coloboma and anophthalmia. Often there was considerable plication of the retina. (Nederl. tijdschr. v. geneesk. 99:2119, 1955.)

From these experiments it becomes evident that dysfunction of the thyroid gland during pregnancy may cause a high percentage of embryonic resorptions and congenital malformations. These anomalies may be partly due to oxygen deficiency.

GENEVA

Familial susceptibility to kidney disease—The importance of heredity in such renal conditions as malformation of the kidneys (especially polycystic kidneys), abnormalities of the renal pelvis, renal dystopias, and changes in kidney form and volume has been known for many years; however, the role of heredity in the field of bilateral medical diseases of the kidney has been less often emphasized. M. Poli (Helvet. med. acta. 22:109, 1955) has contributed an interesting personal study of the problem.

For several years he observed a family affected with kidney disease. Of 92 descendants, 28 persons were subjected to direct control. At repeated examinations, 16 (56.9 per cent) showed proteinuria and 17 (60.8 per cent) had hematuria. Eight died of a kidney ailment, and two others probably were affected by renal disease. The pathologic anatomic examination of one person who died of uremia at the age of 20 showed that a rather atypical disease was the cause of death. In fact, the disease could be differentiated from malignant nephrosclerosis by the lesser gravity of vascular lesion and from albuminous and membranous nephritis by the lesser thickening of the basal membranes as well as by the completely different clinical picture.

The anatomic entity that the disease most resembles is the ascending type of subacute pyelonephritis, but clinically there is an absence of pyuria. Hence, here is a disease entity of relatively uniform clinical evolution, occurring in several members of the same family, always more frequent and more serious in men than in women—a disease whose basic clinical symptomatology could be shortened to the following: (1) early appearance of slight albuminuria; (2) progressive development of a hematuric urinary symptom; (3) late occurrence of hypertension seemingly in relation to the severity of renal lesion; (4) late onset of nitrogen retention, hyposthenuria and deficiency of glomerular filtration; and (5) late death due to renal insufficiency and to uremia.

Modern Otology

JULIUS LEMPERT*

Lempert Institute of Otology, New York

JULIUS LEMPERT

EARLY in my experience with otologic surgery, two basic shortcomings in the technics then generally used were apparent to me. One was the unnecessary sacrifice of healthy tissue, which frequently resulted in serious complications. The other was the absence of definitely prescribed procedures for the complete removal of the pathologic processes, without endangering the vital anatomic structures underneath. Obviously, to avoid injury to any of the minute, functionally vital anatomic structures with which the temporal bone is crowded, procedures for the most careful instrumentation had to be clearly defined.

One surgical procedure in which healthy tissue was sacrificed was the universally employed postauricular technic for the surgical removal of obstructive or obliterative exostosis of the external auditory canal, undertaken either to improve hearing or to establish free drainage of a chronic or acute middle ear infection. Postoperative infection of the mastoid process frequently occurred as a result of the unnecessary surgical destruction of the healthy mastoid process. To avoid this complication I devised the technic for removing exostosis through the endaural approach, without opening the mastoid process.[1] The development and use of the endaural technic was, in my opinion, the milestone in the modernization of otologic surgery (figures 1 and 2).

Plastic procedures then in use for surgical repair of the permanent postauricular fistulas which frequently followed temporal bone surgery were inadequate, since the practice of borrowing neighboring tissue for repair of the old deformity always resulted in a new deformity. Having observed that every postauricular fistula is either partially or completely lined with a funnel-shaped layer of skin and periosteum, I developed and successfully employed a new endaural technic for closing the postauricular fistula without borrowing neighboring tissue and substituting a new scar[2] (figures 3, 4, 5 and 6).

My use of the endaural approach for the

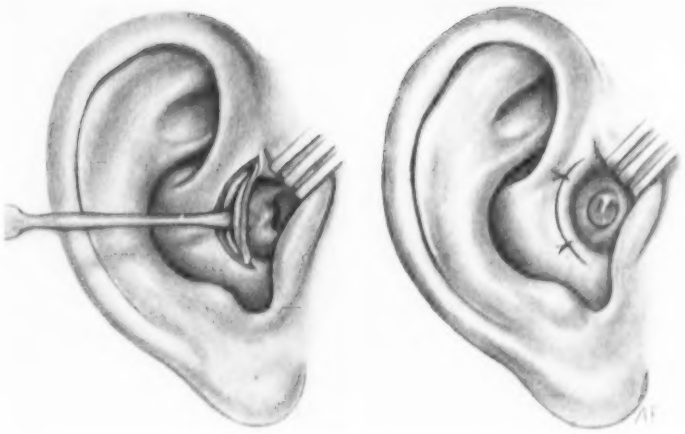
*Lempert Institute of Otology; Lempert Research Foundation, Inc., New York, New York.

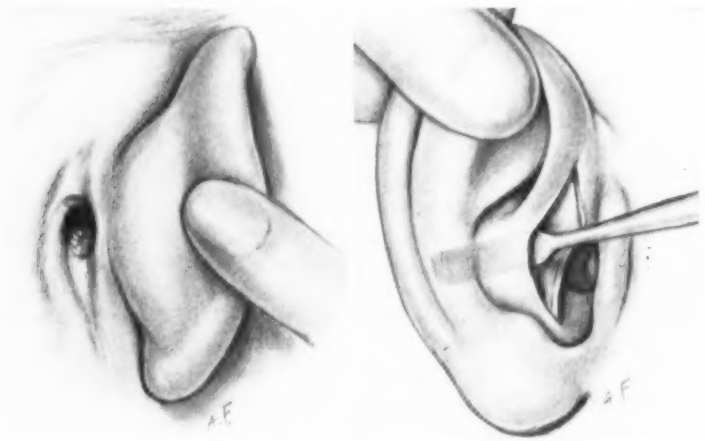
Presented before the thirty-ninth annual Assembly of the Interstate Postgraduate Medical Association at Minneapolis.

FIGURES 1 and 2. Endaural removal of obstructive exostosis from external auditory canal.

1. Subperiosteal elevation of skin and periosteum for removal of exostosis mass.

2. Normal contour of external auditory canal has been reestablished. The tympanic membrane is now visible. The subperiosteally elevated skin and periosteum are replaced and held in position with paraffin mesh gauze.





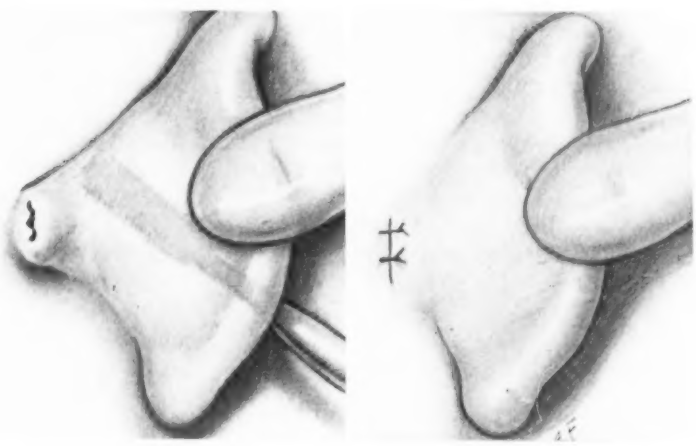
FIGURES 3, 4, 5 and 6. Lempert plastic technic for closure of postauricular fistula.

3. Postauricular fistula.

4. Subperiosteal elevation of auricle from its bony attachments, through endaural incision.

5. Subperiosteal elevation and eversion outward, through the endaural incision, of inverted skin lining postauricular fistula. The postauricular skin deficiency is thus converted into a skin surplus.

6. Closure of postauricular fistula by suturing the edges of skin and periosteum.



correction of postauricular mastoid fistulas soon made it obvious to me that if the endaural approach were adopted and employed exclusively for all temporal bone surgery, postoperative occurrence of postauricular fistulas would be eliminated completely. I first described this endaural approach in 1928[3] and have used it exclusively ever since. However, the endaural approach did not come into general use until 1938, following my development and description of the one stage fenestration operation for the restoration of practical, serviceable, physiologic hearing in clinical otosclerosis.[4]

In my publications describing the endaural approach I also pointed out that the so-called "radical mastoidectomy," when performed postauricularly, was a misnomer, since it was not radical enough. When used by the otologist with old-school training, his fear of accidental injury to the functionally vital anatomic structures lying hidden from view by the pathologic process often resulted in his failure to remove all the pathology. Having been taught how to exenterate the pathology, but having been simultaneously warned to stay away from the facial nerve, the oval window, the lateral sinus, etc., his desire to avoid accidental injury frequently resulted in his leaving some of the pathology. Therefore, I advocated use of the procedure which I named "complete mastoidotympanectomy."[5] As the name implies, the purpose of this procedure is the complete eradication of all the pathologic processes encountered within the mastoid process and within the tympanic spaces.

To instill confidence in performing the mastoidotympanectomy without injury to any of the vital anatomic structures hidden from view by the pathologic processes, I practiced and taught the removal of pathology by instrumentation with magnified vision, always directed away from the vital structures, instead of using blind instrumentation directed through the pathology toward the unseen anatomic structures. Calling attention to the fact that all pathology within the tympanic spaces lies on a thickened, chronically inflamed carpet, namely, the mucoperiosteum, which covers all the anatomy of the inner walls of the tympanic spaces, I pointed out that by lifting the mucoperiosteum away from its attachments to the inner tympanic bony walls—instead of curetting the pathology in the direction of the vital anatomy—all the pathology, including the mucoperiosteum, can be removed without danger of injuring any of the underlying vital anatomy. Thus, performance of the radical mastoidectomy, endaurally, rendered this surgery safe in the hands of the properly trained young otologist. He could now promise the patient a dry ear, a result he was never able to expect before (figures 7, 8, 9 and 10).

To further insure against blind accidental injury to the vital anatomy within the mastoid portion of the temporal bone, I practiced and taught the subcortical approach for opening the usually encountered sclerotic mastoid process through the posterior bony wall of the external auditory canal which is formed by the anterior mastoid cortex.[6] Beginning with the notch of Rivinus and working from within outward (in a direction away from the vital anatomy, instead of working with hammer and chisel blindly from without inward through the outer mastoid cortex in a direction toward the vital anatomy), accidental damage to the lateral sinus, external semicircular canal, and middle or posterior fossa dura is prevented.

The advantage of direct vision in the endaural approach has led to a reversal of an operating room scene, often familiar in the old days, between the otologist and the anesthetist. Then, it was the anesthetist, observing that the patient's face had become crooked, who would advise the surgeon that the facial nerve had been accidentally injured. The surgeon, working blindly, had no way of knowing this directly. However, the well-trained otologist today, working endaurally, is immediately aware of any accidental injury to the facial nerve and can take prompt action to repair it[7] (figures 11, 12, 13 and 14).

In the early days of otologic surgery, the extension of a temporal bone infection to the cellular structure of the apical carotid portion of the petrous pyramid usually resulted in suppurative meningitis. Prior to the appearance of the sulfonamide drugs and penicillin, this

FIGURES 7, 8, 9 and 10. Lempert subcortical mastoidotympanectomy.

7. The tympanic inner margin of the posterior wall of the external auditory canal is engaged with an electrically driven sharp cutting bur and the anterior wall of the mastoid cortex is gradually removed from within outward.

8. The pathologic processes within the tympanum, epitympanum and hypotympanum are seen now, exposed to view and resting on the thickened and diseased mucoperiosteum.

9. The diseased mucoperiosteum together with the pathologic processes resting on it are being removed by separating and elevating the mucoperiosteum from its bony tympanic walls.

10. The outer wall of the mastoid cortex, finally removed, exposing to view all the vital anatomy within the completely exenterated mastoidotympanic wound.

FIGURES 11, 12, 13 and 14. Lempert end-to-end anastomosis of injured facial nerve.

◀11. The most commonly encountered facial nerve injury as a result of temporal bone surgery is the inward fracture of the bony wall of the facial canal. Removal of the fractured-inward portion of the bony capsule results in decompression of the facial nerve.

12. Severed facial nerve is seen. ▶

13. The severed facial nerve is dislodged from its curved bed within the bony facial canal. ▶

◀14. Since a straight line is the shortest distance between two points, there is no need for nerve transplantation. End-to-end suture is used for facial nerve repair.

FIGURE 15. Lempert apicectomy for complete exenteration of petrous apex in suppurative apicitis.

Mastoid process is completely severed from the basal labyrinthine portion of the petrous pyramid. The cellular structure of the apical carotid portion of the petrous pyramid is completely exenterated. Just as the lateral sinus is the guide to complete mastoid cell exenteration, the internal carotid is the guide to complete cell exenteration within the petrous apex.

was generally fatal. Although the petrous apex was referred to in the literature as surgically unapproachable, I succeeded in perfecting and successfully employing the "complete apicectomy" technic for the complete exenteration of the diseased cellular structure from the apical carotid portion of the petrous pyramid[8] (figure 15). In many cases the extension of the infection to the cerebrospinal fluid system was thus prevented.

For the conservation of hearing following the surgical treatment of chronic suppurative mastoido-epitympanitis I devised and perfected the endaural mastoido-epitympanotomy technic.[9] With the use of this technic, all the pathologic processes could be removed from the epitympanum both in front and in back of the functionally impeded incudomalleal joint, without disrupting the ossicular chain. This technic also embraces a plastically constructed tympanomeatal flap for sealing off the tympanic spaces from the mastoid process and the sealing of a labyrinthine fistula, when one is encountered (figure 16). The development of this technic led to my later development of the one stage fenestration operation for the permanent restoration of practical, serviceable, unaided physiologic hearing in deafness secondary to stapedial ankylosis resulting from otosclerosis.

My first description of the one stage endaural fenestration operation, published in 1938,[10] advanced the theory that middle ear hearing loss secondary to stapedial fixation in otosclerosis is due to a disturbance in either phase or pressure relationship between the mobilization of the inner ear fluids by air-borne sound on the vestibular side and the mobilization of the inner ear fluids on the tympanic side of the basilar membrane. It was suggested that, because of this, the basilar membrane was not in the most effective vibratory state needed for normal transmission of sound to the organ of Corti. This theory made it possible to plan the fenestration operation along the physiologico-anatomic lines necessary for the remobilization of the inner ear fluids, to put the basilar membrane into the most effective vibratory state produced by air-borne

FIGURE 16. Lempert endaural mastoido-atticotomy.

The pathologic lesion is removed from the epitympanum and mastoid process without disrupting the ossicular chain. The visible tympanomeatal pedicle flap for sealing the tympanic space and isolating and excommunicating the mastoid process from the tympanic space is seen.

sound pressure on it. The correctness of my theory has since been corroborated with animal experimentation by Wever and Lawrence,[11] and clinically by Skoog[12] of the Karolinska Institute.

Pioneers in fenestration surgery of the external semicircular canal, such as Holmgren of Sweden and Sourdille of France, often encountered osteogenetic closure of the newly created fenestra in a matter of a few weeks or months after the operation. The improvement in hearing was thereby lost. I therefore advanced the theory that osteogenesis could be prevented by invagination of the portion of the tympanomeatal flap covering the newly created fenestra so that its inner surface facing the fenestra touches the bony edges of the fenestra rim, with the flap becoming adherent to the fenestra edges.[13] Although this theory was basically correct it failed to prevent osteogenesis in the majority of instances. I then observed that the fenestra made in the external semicircular canal in the region posterior to the ampulla was too narrow, in most cases, to permit invagination and adhesion of the flap to the fenestra edges. Therefore, I advocated creating the fenestra further forward and anterior to the ampulla in the surgical dome of the vestibule where the fenestra could be made much wider and could communicate directly with the vestibule.[14] This change in technic was the final step in the ultimate success of the fenestration operation. Postoperative osteogenetic closure is a thing of the past and can be avoided in almost 100 per cent of the cases.[15]

I also introduced an improved technic for creating the fenestra. This is the cupola procedure for eliminating formation of bone dust or bone chips which occasionally had been responsible for occurrence of perilymphatic osteogenesis, an incorrectable complication of the fenestration operation[16] (figure 17).

Today my fenestration technic is universally employed. It is possible, currently, in following meticulously performed fenestration surgery, to obtain permanent, practical, serviceable, physiologic hearing improvement in about 85 per cent of the cases carefully diagnosed as air-conduction deafness secondary to

FIGURE 17. The permanently patent fenestra nov-ovalis. The bony cupola is removed intact to uncap the perilymphatic space and expose to view the endolymphatic labyrinth.

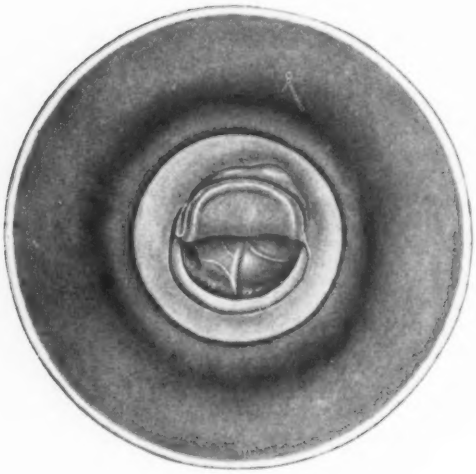
stapedial ankylosis of otosclerotic origin, in the presence of good hearing by bone-conducted sound.

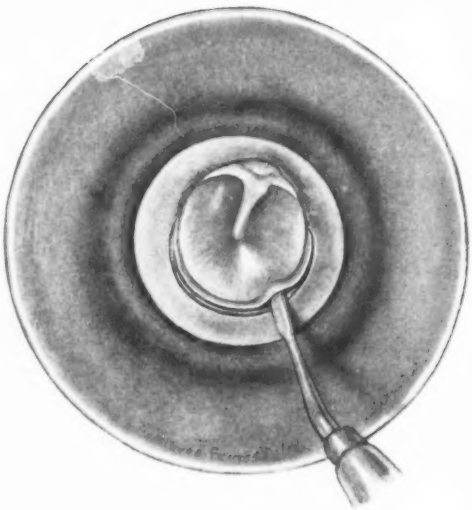
Another endaural technic which I developed was the procedure for dislodging a part of the annulus fibrosus of the tympanic membrane from the sulcus tympanicus, for surgical intervention within the tympanic cavity and replacement of the tympanic membrane into its normal position within the sulcus tympanicus without injury to it. This technic has been described and successfully used by me in performing the tympanosympathectomy for the relief of severe tinnitus accompanying chronic adhesive middle ear lesions[17] (figures 18 and 19). I employed this technic successfully, also, in the surgical treatment of Menière's disease, by removing the stapes and destroying the round window membrane to relieve both the vertigo and the tinnitus[18] (figures 20 and 21). This method of dislodging the tympanic membrane endaurally can also be employed in the search for and removal of pathology sometimes found in the hypotympanum in persistent cases of serootitis, and replacing the tympanic membrane without injury to it.[19]

Seeking to correlate the symptomatology with the pathology in Menière's disease, I

FIGURES 18 and 19. Lempert tympanosympathectomy.

18. With the aid of a periosteal elevator, the cutaneous lining of the external auditory canal is subperiosteally elevated and the lower half of the annulus fibrosus of the tympanic membrane is disengaged from the sulcus tympanicus.





19. The lower half of the tympanic membrane with its annulus fibrosus is shown, everted. Exposed to view is the tympanic nerve plexus to be removed.

FIGURES 20 and 21. Lempert decompression operation for relief of vertigo and tinnitus in Menière's disease.

21. The round window membrane is removed to drain the cochlear perilymph.

20. The posterior half of the tympanic membrane is everted. The stapes is removed from the oval window to drain the vestibular perilymph.

have conducted a number of basic research experiments. For the first time in the history of otology I have studied histologically the membranous labyrinth removed in vivo during the performance of the labyrinthectomy for the arrest of vertigo in Menière's disease. In 28 consecutive cases I found the inner walls of the membranous endolymphatic labyrinth studded with ruptured and unruptured epithelial vesicles. As a result of this study, I advanced the theory that Menière's disease is not due to hypersecretion or poor resorption of endolymph, but rather to a herpetic neuritis of the vestibular branch of the eighth nerve. The paroxysmal attacks of vertigo are due to periodic rupture of vesicles, and contamination of the endolymph by toxic fluid. The deafness is secondary to the action of the contaminated endolymph on the hair cells of the organ of Corti. Since the endolymphatic labyrinth is of ectodermal origin embryologically, I investigated and compared the pathology of vesicles in herpes zoster and found the cellular pathologic changes the same as in Menière's, thus strengthening further my theory of Menière's disease.[20]

My step-by-step development of modern otology has not only provided the key to more successful surgical treatment of acute and chronic temporal bone infection, but has also opened the door widely to the successful surgical treatment of most of the functional middle ear disorders and some internal ear disorders as well.

The accomplishments in otologic surgery have been great, but much remains to be done. For the best interests of the future of our work I feel it is in order for me to call attention to some persistent faults which, if overcome, can lead to even more successful practice of modern otology. These are:

1. The failure of too many otorhinolaryngologists to train and perfect themselves in new, modern otologic surgery which is greatly in demand. Instead, they embrace other, less exacting fields of endeavor. Thus, training in otologic surgery and research is being lost to the young intern by default of his superiors, and the continuity of progress in otology is once again being retarded.

2. The performance of the fenestration operation by some otorhinolaryngologists without having first prepared themselves adequately for this type of delicate precision surgery. This tends to discredit this surgery in their communities.

3. The commonly used systemic penicillin treatment for recurrent attacks of acute suppurative otitis media, without establishing drainage of the infection by myringotomy. As a result, there is appearing a new generation of air-conduction deafened children, a sequela to otitis media not encountered, as a rule, when drainage alone was practiced, before the advent of penicillin.

4. The postponement and delay of obviously needed surgical removal of pathology by the continuous year in, year out local medical treatment of chronic recurrent suppurative epitympanitis with cholesteatoma. This leads ultimately to the onset of vertiginous attacks secondary to the formation of a labyrinthine fistula, or of a handicapping hearing loss, due to necrosis or ankylosis of the incudomalleal joint.

5. The dangerous reliance on the antibiotics for the cure of intracranial complications secondary to temporal bone infection without the search for and removal of the temporal bone pathology responsible for these complications.

6. The continuous use of locally applied solutions and powders for the arrest of chronic purulent middle ear discharge, with no consideration for the necessity of removing the pathology that is responsible for its continuous existence.

7. The continuing use by some otorhinolaryngologists of measures long since discredited for the improvement of hearing in chronic progressive deafness secondary to otosclerosis—such as tonsillectomy, submucous resection of the nasal septum, the radium applicator for removal of lymphoid tissue from the region of the eustachian tubes, inflation of the eustachian tubes, temporal bone x-ray therapy, ossicular-chain electric oscillators, eustachian tube orifice dilators, etc.—coupled with reiterated reassurance that if these measures do not improve the patient's hearing they can then take advantage of the fenestration opera-

tion which can restore their hearing to the practical, serviceable level.

8. Unjustifiable claims that the use of vasodilators results in the cure of nerve deafness, tinnitus and vertigo. Actually there is no existing scientific proof that intracranial vasoconstriction of the internal auditory artery sufficient to produce anoxia is ever present. On the contrary, experimental evidence obtained in the monkey has shown that following complete denervation of either the sympathetic or parasympathetic supply to the inner ear, histologic examination failed to indicate any signs of damage to the sensory structures of the cochlea or vestibular labyrinth, or any evidence of distortion, as a result of fluid changes.[21]

9. The claim often made that the chorda tympani nerve, which, after many years of physiologic investigation, was believed to be the conveyor of autonomic motor fibers for the regulation of salivary gland secretion and sensory fibers of taste, comprises a second sonic system. This is the most amazing stumbling block of all thrown in the pathway of progress in otology, and the most confusing to the young otologist. We are told that by cutting the chorda tympani, tinnitus can be relieved.[22] As a follow-up, we are told further that this is not so remarkable for we can cut the same nerve and *voilà* we have a cure for Menière's disease! What seems even more remarkable is that after the chorda tympani nerve has been destroyed, by either disease or radical mastoid surgery, the same dysfunction of the ear, now called "vertigo like Menière's," can be cured by destroying another conveniently placed autonomic nerve, namely, Jacobson's nerve.[23] How it is that vertigo can be present before interruption of the chorda tympani, can be cured by cutting the chorda tympani, can be present again after its removal and can be relieved again by cutting a second autonomic nerve, Jacobson's nerve, the author of this "cure-all" has not yet bothered to explain.

10. The unfortunate attempt to turn back the clock of progress in otology by the revival of the Miot[24] technic for attempting to mobilize the ankylosed stapediovestibular joint to improve the hearing in deafness of otosclerotic origin. This technic was amply tried, finally discredited, condemned and abandoned 50 years ago, despite the fact that there existed at the time no other means for the improvement of hearing in clinical otosclerosis. Since the possibility of mobilizing the ankylosed stapes without disrupting the ossicular chain is unpredictable preoperatively, and the chances of the occasionally mobilized stapes remaining mobile are remote, the odds are heavily stacked against the patient's obtaining his desired hearing improvement. Nevertheless, the use of stapedial mobilization is being advocated[25] as a primary surgical procedure mainly because it is less time-consuming for both the otologist and the patient than the time-proved, preoperatively predictable fenestration operation with its overwhelmingly successful postoperative results. The proponents of this revived Miot procedure, being perfectly conscious of the fact that this technic for the improvement of hearing in otosclerosis is not, as a rule, a means toward an end of the hearing loss, promise their patients that they can always have their hearing improved with the Lempert fenestration operation should they fail in their gamble with stapedial mobilization. Unfortunately, the many otorhinolaryngologists who have never found time to train themselves in fenestration surgery but who today unhesitatingly attempt surgically to mobilize the ankylosed stapediovestibular joint do not realize that the cutaneous lining of the external auditory canal, membrana tympani and tympanic cavity, if previously tampered with in an attempt to mobilize the stapes, creates a poor foundation for the successful performance of fenestration surgery. If these practitioners of the mobilization technic were called on personally to make good their promise to their patients, they would have to admit that their promise is an empty one since in many instances the fenestration operation can no longer be performed. And, too, in those cases which still lend themselves to the performance of the fenestration operation, the hearing improvement obtained therefrom is not commensurate with the hearing improvement these patients could have if they had not

been primarily subjected to mobilization of the stapes.

11. The failure of authors to report and, much worse, permit themselves to be forever quoted when, after publishing what they believed to be advances in otology, their theories have later been found to be wanting and fail to live up to expectations.

Conclusions

There is one persistent area of misunderstanding concerning temporal bone surgery which, at the risk of being overemphatic, I should like to stress. That is the widespread belief that otology is a much contracted specialty and that it has become limited in scope since the impact of the antibiotics and chemotherapy.

The opposite is true. The practice of otology, more than ever before, offers a wide field of usefulness to the otologist properly trained to pursue it.

I reiterate that there is no shortage of surgical material—but rather there is a shortage of surgeons properly trained to take advantage of the abundance of temporal bone surgery waiting to be done.

The new technics of modern otology, once mastered, lead to more rewarding, more fascinating and more humanitarian work.

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Surgery for Peptic Ulcer

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I AM very grateful for this opportunity of substituting for my eminent chief. Actually, I cannot come before you as an expert on the subject of peptic ulcer, but I do possess a fistful of Dr. Wangensteen's reprints which he put into my hand before he left town. From your point of view, my being here may have a special virtue. I haven't invented any of the operations I am going to tell you about, and my opinion may therefore be relatively unbiased. There are a lot of operations to form an opinion about in this type of surgery.

In Ivy's book on peptic ulcer,[1] one illustration shows 17 different operations for the disease; hardly any of them are in vogue any more, so it is easy to form an opinion about most of them—they are not much good. But there are still a lot of different operations advocated for the disease, and the reason is quite easy to understand—it is not simple to cure peptic ulcer. If you operate merely to excise some pathologic condition or to reconstruct the anatomy so that everything ends up in a normal fashion, this is a good type of surgery which is usually highly successful. Two examples are an appendectomy for appendicitis or an operation to divide a patent ductus arteriosus. Surgery for peptic ulcer is of a different type; you might call it "physiologic surgery." The idea is to change the physiology so that the disease will abate but so that the operation will still have produced only relatively minor structural and functional changes of an adverse nature.

Unfortunately, all the operations that have been devised for ulcer alter the digestive function from the normal. The objective is to get rid of the disease and still leave a fairly normal gastrointestinal tract.

During the past 50 years, surgeons have used an amazing array of operations and they have only slowly come to understand some of the sound physiologic principles that go to make up a good operation for the disease. It

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is gratifying, I think, to find that we stand at a point where well-established operations are generally employed and to know that these operations are usually of great help to the patients suffering from peptic ulcer. The conventional gastric resection is a satisfactory operation for about 90 per cent of the people on whom it is done.

Indications for Surgery

Who should have an operation for peptic ulcer? If the operation were better, you might advocate it for most people with peptic ulcers, because medical treatment of the disease is not satisfactory. Over 50 per cent of peptic ulcer patients who are treated medically have a poor result, and the mortality rate with such treatment over a period of years is about 2 per cent.[2] But surgery is not yet quite good enough so that it may be advocated for the majority of patients with ulcer. Instead, its use is limited to those with certain indications. The most commonly cited indications for surgery of peptic ulcer are obstruction, hemorrhage, perforation, intractable pain, and a gastric ulcer which does not heal promptly.

In our patients, intractable pain has been the most common indication for surgery. This is usually not a persistent, irremediable pain. It is simply a recurrent pain that comes unless a diet is followed carefully and indefinitely. Usually this indication is found in the patient who has had ulcer for many years and who finally decides he would like to get rid of it, even if it means having an operation. The average duration of the disease in the people we have operated on was about 12 years.[3]

The indications for surgery that I wish especially to consider are perforation and hemorrhage. They are important because they seem to be the complications that still produce most of the deaths. Of the 129 patients who died due to peptic ulcer in Minnesota during 1952, 28 per cent died of perforation and 46 per cent died of hemorrhage.[4]

Perforation—Perforation is a fairly common complication in peptic ulcer. Of the 893 patients with peptic ulcer on whom we did gastric resection between 1940 and 1949, 117 had had a previous perforation. The diagnosis of perforation is usually not difficult but in a few cases, especially in old individuals, it can be quite confusing. In these, particularly, the pneumoperitoneum seen on x-ray examination may be extremely helpful. With an upright film of the abdomen, air can be detected in 60 to 80 per cent of patients with perforation. As high as 80 per cent of patients with perforation have a history of ulcer. A fair percentage may have had a perforation before. These facts help in making the diagnosis.

Once the diagnosis is made, however, there is considerable disagreement about the type of treatment that should be used. Simple closure, gastric resection and nonoperative management are all currently recommended. Simple closure by the technic of Roscoe Graham[5] is probably the most widely employed treatment. With it, the mortality rate is less than 10 per cent and in some special groups it has fallen to 1 or 2 per cent. Though nonoperative management with continuous gastric suction was first advocated for selected patients by Wangensteen,[6] he dropped it later and now uses simple closure.

Gastric resection for perforated ulcer has recently been advocated by a number of authorities in this country and abroad. It is recommended principally because a fair percentage of people who have perforations will continue to have ulcer trouble; in fact, as high as 30 per cent of them will require gastric resection in time, so advocates of an immediate gastric resection feel that you might as well do the definitive operation right off. If you are going to use primary gastric resection in any cases with perforation, perhaps the best ones to use it for are patients with gastric ulcer, concomitant hemorrhage, or a long history of ulcer, or those in which simple closure might result in obstruction. Certainly gastric resection is the best course for a perforated gastric ulcer, because these ulcers are frequently malignant and hence a simple closure may not lead to healing of the perforation.

If you want to use nonoperative management for some but not all cases of perforation, the following may be reasonable indications: old and probably sealed perforation, the presence of serious associated disease, and

situations where good surgery is not available.

Hemorrhage—Hemorrhage is still the biggest cause of death in peptic ulcer. In cases of severe hemorrhage, medical treatment alone may not suffice; some patients continue to bleed and may die if surgery is not used. In those who continue to bleed more than two or three days, the mortality rate is about 50 per cent with medical management, while with surgery it falls to around 20 per cent. Therefore, surgery is indicated for the patient with continued bleeding. But surgical procedures in such cases often have been performed too late, and so there has been a considerable interest in trying to set up good criteria for earlier surgery in some patients with hemorrhage. Most surgeons who talk on the subject think that hemorrhaging patients should be in the hands of a surgeon and that the surgeon should be ready to operate if the patient continues to bleed longer than 24 or 48 hours, but some surgeons employ immediate surgery for every patient with massive hemorrhage.

We usually pass a nasal tube and drip skim milk continuously if the bleeding has not been sufficient to lower the blood pressure to shock levels. If the patient's blood pressure has fallen, we operate.

More complex criteria have been set up, but I will not go into them, save to note some points of fairly general agreement. If the ulcer is known to be a gastric ulcer, surgery is strongly indicated; if the patient is over 50 years of age, surgery should be employed early, and if bleeding continues more than 48 hours, gastric resection probably should be done. Finally, if perforation and hemorrhage occur together, gastric resection is indicated.

Operations and Results

The important physiologic change brought about by a good operation for peptic ulcer is reduction of gastric acidity. This change is effectively produced by a partial or subtotal gastric resection which removes most of the parietal cells. The most widely used resections have been variations of the Billroth II operation. For a number of years we used such an operation at the University of Minnesota and felt that, to be successful in curing the ulcer, it should have the following specifications: Approximately three-fourths of the stomach should be removed, most of the lesser curvature should be resected, the entire antral mucosa must be removed, and the anastomosis made near the duodenojejunal junction.

This operation was used in 893 cases of peptic ulcer,[3] and in general the results were good. The mortality rate was low (2.7 per cent in recent years) and the incidence of recurrent ulceration was only 1.8 per cent. But still the operation was not ideal since many of the patients have had distress postoperatively. About 50 per cent had some degree of the "dumping syndrome," weight loss was relatively common, and moderate anemia was frequent. Actually, a critical over-all evaluation showed that only 10 per cent of the patients had a result that could be called poor, and 27 per cent had an excellent result, but a large group (63 per cent) had some trouble and their result could only be called satisfactory. There is room for improvement and it is logical to search for a better operation.

Vagotomy has been widely used as an alternative to subtotal gastric resection. Clinically we have had little experience with this operation but we have found, in common with many others, that it is effective in reducing gastric acidity. It also reduces gastric motility and leads to retention so that, used alone, it is unsatisfactory and has been abandoned; it must be combined with a drainage operation—a gastroenterotomy, small gastric resection, or pyloroplasty. It is difficult to tell whether or not vagotomy plus one of these is better than the conventional gastric resection. I certainly do not know but can only refer you to the report of the Committee on Surgical Procedures of the National Committee on Peptic Ulcer of the American Gastroenterological Association. This committee surveyed several thousand patients and produced a thick volume on the subject.[7] They concluded that the results following partial gastric resection alone were superior to those following vagotomy with gastroenterotomy but that vagotomy with a small gastric resection was probably as good as a partial gastric resection alone.

So much for vagotomy. At our hospital

Wangensteen has developed two significant variations of the partial gastric resection. One of these is a segmental gastric resection in which the middle two-thirds of the stomach is excised and the remaining upper portion is then anastomosed to the antrum.[8] After this operation, food leaves the stomach through the normal channels—the pylorus and the duodenum. With this type of resection it is not dangerous to leave the antrum. When the antrum remains to carry food and acid out of the stomach, as it does with this operation, there is not the striking increase in the second phase of gastric resection (mediated by the hormone gastrin) which follows if part of the antrum is left as a blind stump after the Billroth II operation. The segmental type of gastric resection is a successful operation in that it cures the duodenal ulcer, but in most respects the results have not been significantly better than those obtained with the conventional Billroth II type of operation. About the same percentage of patients have trouble with the dumping syndrome. So another operation has been devised which seems to be an improvement.[9, 10]

This new operation is a tubular gastric resection, a modification of Connell's fundusectomy. In the tubular gastric resection a much larger part of the stomach is removed—a generous wedge which includes most of the greater curvature and a large part of the anterior and posterior walls. Most of the acid-secreting part of the stomach is removed but the lesser curvature is left intact. The remaining upper portion is stitched to the lower segment to form a miniature stomach. Since the vagus nerves are left intact, the pyloric sphincter functions normally and it is ordinarily not necessary to do a pyloroplasty. Probably because this operation does leave the gastric-emptying mechanism intact, it has been followed by a lower incidence of the dumping syndrome than was noted after either the Billroth II type of resection or the segmental resection. In any case, a relatively early evaluation indicates that it is a good operation for peptic ulcer and probably better than any of the others we have used.

Conclusions

A completely satisfactory operation for peptic ulcer may not have been developed yet, but even the operations which are commonly used are good enough to greatly benefit most of the patients who need surgery. Many people with chronic, recurring peptic ulcer need operation, and the need can be recognized without first requiring a patient to live with his ulcer for 10 to 20 years longer.

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The Adrenal Cortex and Its Relation to Disease

JOHN C. BECK*

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COMING to this area of the country to speak on the adrenal glands is something like carrying coals to Newcastle, because we are very much indebted for our understanding of adrenocortical physiology to the research work which has been carried out at the Mayo Clinic.

JOHN C. BECK

The title of this clinic may at first seem rather far removed from the problems of everyday practice, but if you re-examine this whole problem you will find that we physicians are producing more and more examples of adrenal dysfunction in our practices.

The reasons for this are several. The widespread use of ACTH and cortisone, particularly cortisone, over long periods, with sudden arrest of the therapy, leads to a functional adrenal insufficiency—that is, it is just as effective as taking out the patient's adrenal glands for a period of time after cessation of therapy (figure 1). Therefore, it becomes extremely important to be aware of the signs and symptoms and the physiopathology of adrenal hypofunction.

Likewise, use of these agents in large amounts over a long period may produce signs and symptoms and biochemical disorders very similar to those seen in Cushing's syndrome.

I shall present first an example of adrenal hypofunction and then discuss adrenal hyperfunction and the possible role of the adrenal glands in some other disorders such as rheumatoid arthritis, bronchial asthma, nephrosis, malignant hypertension, congestive heart-failure, and preeclampsia and eclampsia.

Addison's Disease

I am very indebted to Dr. Irvine McQuarrie of the University of Minnesota Medical School

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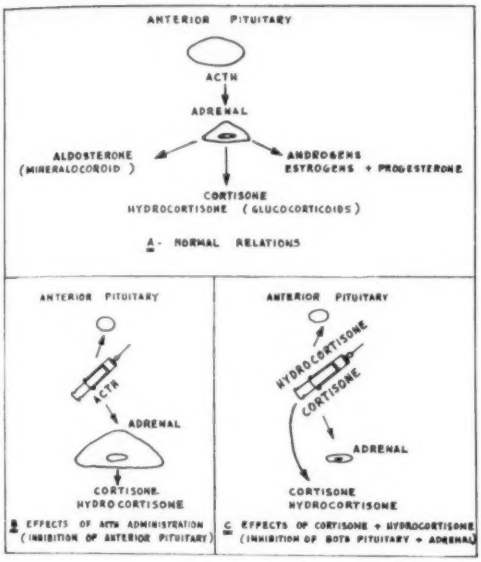

FIGURE 1. Pituitary-adrenal relationships as modified by ACTH, cortisone or hydrocortisone.

for supplying me with an example of Addison's disease. This young chap, Robert, is now seven years old. He was in good health until 21 months of age, when he began to have attacks of listlessness, anorexia, nausea, vomiting and high fever and would become semistuporous or even stuporous.

The first attack occurred in January 1949. There were recurrences in February and October 1950, and finally in January 1951 the diagnosis was made. The boy's mother, on questioning, supplied the information that she had noticed increasing pigmentation of his skin since the age of six months. At the time the diagnosis was made he was deeply pigmented over the palmar creases, knuckles, elbows and knees and there was general body pigmentation.

Pertinent clinical and laboratory findings included the following: pigmentation as described; dehydration; hypotension; serum chlorides of 86 mEq. per liter, which is low; low serum sodium (122 mEq. per liter), and elevated potassium (6.8 mEq. per liter). The glucose tolerance curve was characteristically extremely flat. An ACTH test was done, using the eosinophils as the criterion of response to ACTH. The control eosinophil count was 172 per cubic millimeter; four hours after intramuscular administration of 25 mg. of ACTH it rose to 237 rather than showing at least a 50 per cent fall.

At present, this chap is in relatively good control. He is being maintained on 12.5 mg. of cortisone given as 6.25 mg. twice daily, and he is receiving desoxycorticosterone each day. However, he still displays a dark, dusky pigmentation which is more marked over the pressure points of the spine. He has the characteristic dirty, grayish pigmentation over his elbows, palmar surfaces and knees.

He shows one other classic feature of Addison's disease, namely, bluish-blackish pigmentation of the oral mucous membranes.

We might review briefly the symptoms, signs and biochemical findings in Addison's disease and then go on to the question of adrenal hyperfunction. These persons complain of weakness and easy fatigability. They have episodes of anorexia and vomiting which are not constant but are often associated with infection. They have occasional diarrhea, frequent abdominal pain, hypoglycemic manifestations similar to those caused by excess quantities of insulin, and occasionally, in the adult, changes in gonadal function.

In addition to the characteristic abnormal pigmentation, many persons with Addison's disease show increased numbers of pigmented nevi, and approximately 20 per cent have vitiligo. Examination discloses dehydration, hypotension, a small heart, and occasional tenderness over the costovertebral angle if it is a case of acute adrenal insufficiency or adrenal insufficiency of relatively recent onset (Rogoff's sign).

The usual laboratory findings are a depressed serum sodium, an elevated potassium and hemoconcentration. If one has facilities for doing steroid assays, one finds low 17-ketosteroids which are, in part, an expression of adrenal steroid output, and low biologic and chemical corticoids which, again, are a measure of what the adrenals are producing. There is a flat glucose tolerance curve. Abnormalities are noted in electrocardiogram

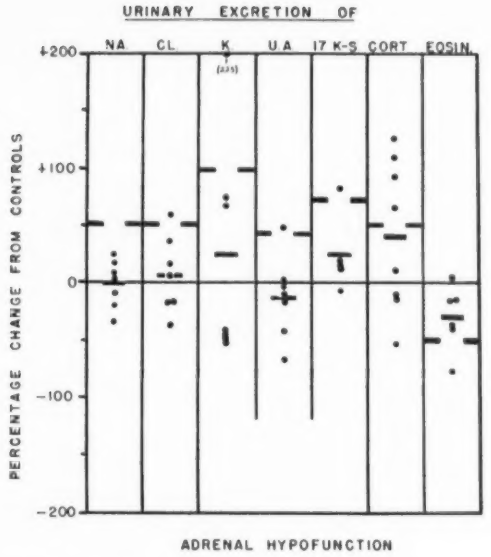

FIGURE 2. A composite group of ACTH tests carried out in Addison's disease. A dose of 25 units of ACTH was given, and the following parameters of adrenal function were studied on urinary samples eight hours before and six hours after ACTH: sodium, chloride, potassium, uric acid, 17-ketosteroids, formaldehydogenic corticoids. Eosinophil counts were done before and four hours after ACTH administration. The heavy bars are the mean responses of a group of normals.

and electro-encephalogram, and occasionally, if the Addison's disease is on the basis of long-standing tuberculosis of the adrenals, one may find calcification in the adrenal area on x-ray examination of the abdomen.

Many tests for adrenocortical function have been introduced, some of which I have already mentioned. One finding which is of very great use is the inability of the patient with Addison's disease to handle a water load, and this child also demonstrated that phenomenon.

Finally, there recently have been many types of ACTH tests, following the work of Dr. George Thorn of Boston in 1949. This young boy had an ACTH test in which the eosinophils were the only criterion of response. Figure 2 illustrates the type of ACTH test procedure we do at our clinic. In addition to the eosinophils, we measure the changes in the urinary sodium, chloride, potassium, uric acid, 17-ketosteroid and chemical corticoid output after a single 25 unit dose of ACTH. Note the inability to respond to ACTH. Normally, a person should lose sodium temporarily and show little change in chlorides; both effects fail to occur in cases of Addison's disease. Instead of showing an increased excretion of potassium on one dose of ACTH, persons with Addison's disease show no effect. There is no effect on the uric acid and only a very slight effect on the 17-ketosteroid and corticoid output in the urine. Finally, they do not show a 50 per cent drop in the circulating eosinophils.

We should remember that this syndrome, Addison's disease, can be produced in patients on long-term cortisone therapy in whom the cortisone is stopped suddenly. The adrenal insufficiency which is produced does not persist but recovers gradually over weeks or several months. Therefore, these patients must be watched extremely closely in the post-cortisone period.

Cushing's Syndrome

Cushing's syndrome is the example par excellence of adrenal hyperfunction. Persons with this disease complain of weakness, backache and frequent headache. Their history often includes the onset of obesity, particularly of the face and trunk. They complain of acne, easy bruising of the skin, poor healing, and very often of skin infections. Hair growth over the face, especially in women, is another feature, and occasionally a case goes on to virilism. They often have mental abnormalities, ranging from an anxiety state to a schizophrenic or depressive state. They characteristically have purple striae and, finally, up to 95 per cent have hypertension of varying grades of severity.

Laboratory findings of interest are a decreased carbohydrate tolerance in up to 95 per cent of cases, and overt diabetes in about 25 per cent.

X-rays of the spine, skull and pelvis in patients with Cushing's syndrome often reveal marked demineralization. One finds rib fractures and often collapsed vertebrae. They often have an increased hemoglobin or red blood cell count, although this is not an in-

variable phenomenon. They have leukocytosis, and they have eosinopenia, usually below 50 eosinophils per cubic millimeter.

Aside from impaired glucose tolerance, their biochemical findings may be normal, or they may have an elevated serum sodium. One may find a low potassium, or an alkalosis, but these are by no means constant findings. In studying the steroid output in these cases, one usually finds elevated biologic and chemical corticoids—merely an expression, again, of increased production of the adrenocortical steroids—and occasionally, but not invariably, elevated ketosteroids. However, in one type of adrenal hyperfunction there is excessive output of adrenal androgen, and in these cases the patients have the so-called adrenogenital syndrome.

The young woman shown in figure 3 has Cushing's syndrome, with the characteristic rounding of the face, the bluish, cyanotic, flushed appearance and evidence of hirsutism in the form of hair on the chin and upper neck. Although these patients say they are obese, often it is not so much a change in weight as it is a change in its distribution—that is, the obesity is centripetal, confined to the trunk and face. This woman has other characteristic features of Cushing's syndrome, namely, the marked bruising and the characteristic striae as well as some acne over the chest (figure 4). The pinkish, bluish striae have a satin, silken consistency and are classic, seen only in this syndrome. One other feature is the fine hair which often is seen over the back, hips, chest and face.

Another patient with Cushing's syndrome is shown in figure 5. This 26 year old woman has just had a total bilateral adrenalectomy. She had multiple bruises over both lower extremities, and these came on without apparent injury. She had increased hair growth, with temporal recession. Note the striae over the abdomen.

Occasionally these patients have lesions of the pituitary gland. Harvey Cushing, who described this syndrome initially, felt it was due to a basophil adenoma of the anterior pituitary, and these individuals are usually classified as having Cushing's disease in contradistinction to the general clinical picture which is called Cushing's syndrome.

FIGURE 3. A 24 year old woman with Cushing's syndrome, demonstrating the characteristic facies.

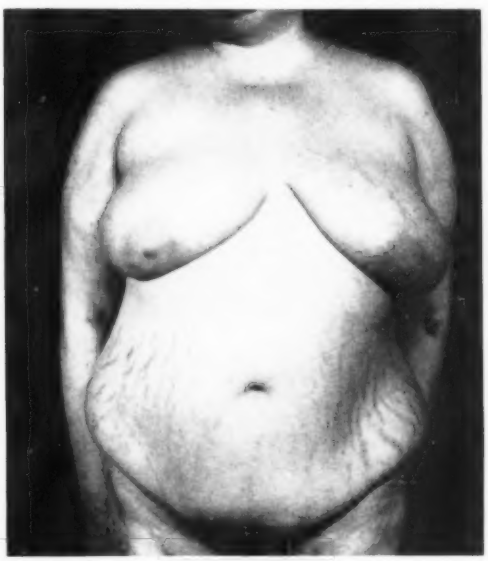

FIGURE 4. Same patient as shown in figure 3, showing acne over the chest and multiple abdominal striae.

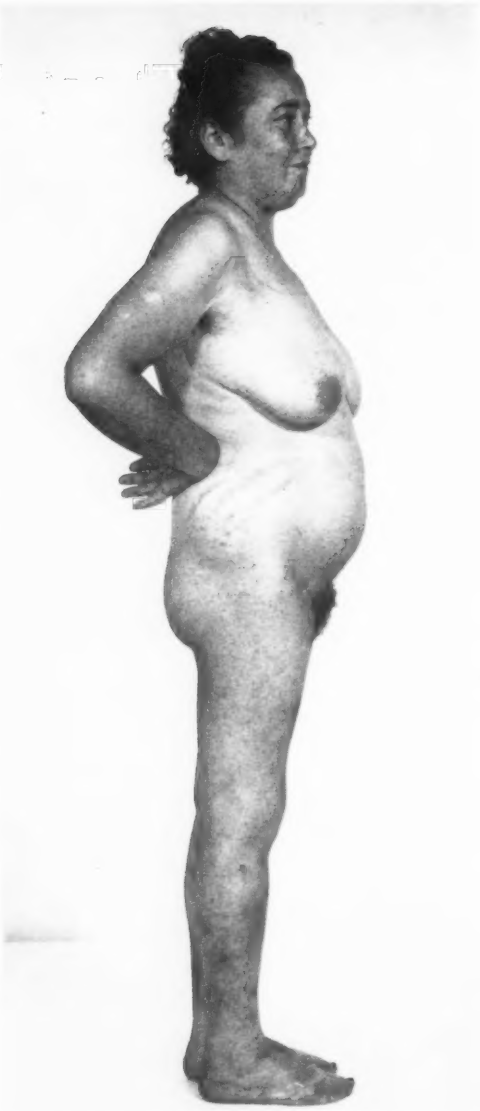

FIGURE 5. A 26 year old woman with Cushing's syndrome. Note the axillary and abdominal striae.

FIGURE 6 *(right)*. Skull x-ray of a 48 year old man with Cushing's disease. Note evidence of destruction of the sella turcica.

The patient whose skull x-ray is shown in figure 6 had true Cushing's disease. Note the evidence of destruction of the posterior clinoid processes and erosion of the dorsum sellae turcicae.

Another feature of Cushing's syndrome is the abnormal collection of fat over the dorsum of the spine, the so-called buffalo hump. Such patients also have supraclavicular fat pads.

The major symptoms of an excess production of adrenal androgens are those of virilism. Instead of getting changes in body contour as regards the distribution of fat, these individuals get marked hypertrophy of the muscular elements. This excess of adrenal androgen leads to hypertrophy of the clitoris. I would like to show you one example of the adrenogenital syndrome in a 29 year old woman. Figure 7 is a photograph taken two years before the onset of her illness, and figure 8 shows her appearance when we first saw her. She had amenorrhea, deepening of the voice, temporal recession of her hair, apical baldness and marked acne. She shaved daily and had excessive hair growth over her face and body. She had marked clitoral hypertrophy (figure 9). An exploratory operation was performed, and an adrenocortical tumor found and removed. That was in 1950, and she has had gradual regression of these signs.

Figure 10 merely demonstrates the marked increase in the amount of 17-ketosteroids

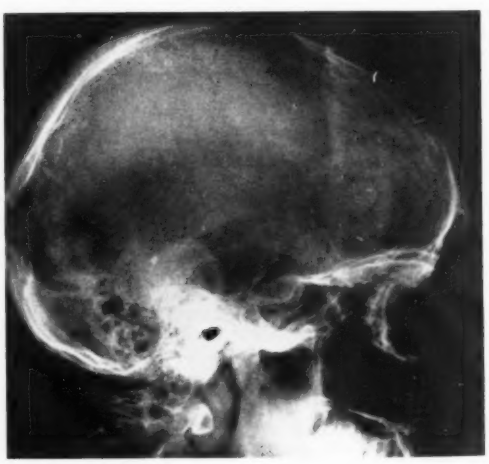

FIGURE 7. Appearance of a patient two years before the onset of the adrenogenital syndrome.

FIGURE 8. Same patient as in figure 7, at 29 years of age. Adrenogenital syndrome due to an adrenocortical adenoma. Note the temporal recession of the hair.

FIGURE 9. Same patient, showing clitoral hypertrophy as further evidence of virilism.

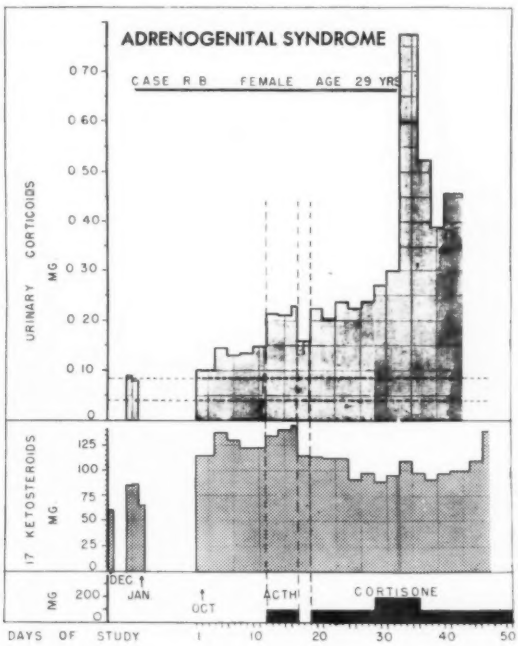

FIGURE 10. Elevated 17-ketosteroids in the adrenogenital syndrome. Note that ketosteroid output is not significantly elevated with ACTH or depressed with cortisone.

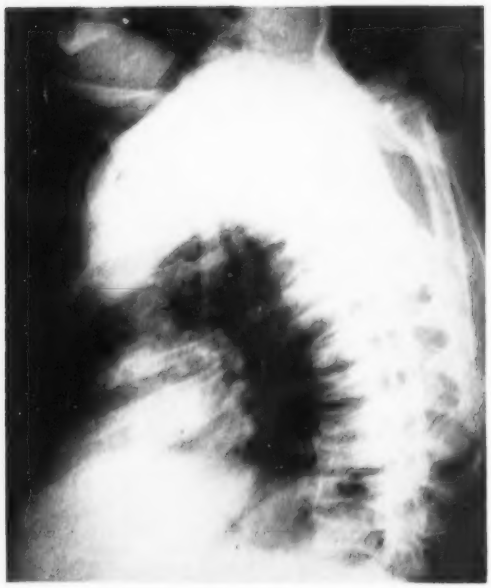

FIGURE 11. Severe osteoporosis and vertebral collapse in a male patient with Cushing's syndrome.

which this tumor was producing somewhere between 75 and 130 mg. in 24 hours. The upper limit of normal in most laboratories is about 15 to 25 mg.

We attempted to see whether this tumor could be stimulated with ACTH; it was not. Similarly, there was only slight depression with cortisone. As you know, if this were a case of adrenogenital syndrome on the basis of a hyperplasia, administration of cortisone would have caused a marked fall in the 17-ketosteroids.

Spinal x-ray changes are common in Cushing's syndrome. In the case illustrated in figure 11, that of a male who had had Cushing's syndrome for many years, in addition to the marked demineralization of the spine there is collapse of the vertebrae, with fracture. If we had time to spend on this, I could demonstrate several rib fractures. This is the so-called "fish spine" of far-advanced Cushing's syndrome.

The glucose tolerance curve in the case of the patient whose skull film is shown in figure 6 can be seen in figure 12. Impairment of the curve is fairly marked. We did an adrenalectomy in two stages in this case. Following the first stage, his glucose tolerance curve improved somewhat.

I noted that long-term, excessive administration of ACTH and cortisone may produce exactly the same sort of clinical picture as I have described for Cushing's syndrome (figure 13). That is why I think it has become so important for us all to be aware of the physiopathologic mechanisms in this disease. Following ACTH one can get a marked impairment of the glucose tolerance curve, which reverts back to normal. In doing so, however, there is a period in which the curve is extremely flat, as is seen in Addison's disease. This merely demonstrates that a period of adrenal insufficiency follows the sudden cessation of either ACTH or cortisone.

Role of the Adrenals in Other Disorders

The role of the adrenal glands in various diseases has been postulated but not proved, and until we acquire further evidence we can only suggest that perhaps they play a very important direct part in a number of diseases or perhaps help mediate the organism's response to the particular disease processes which I shall mention subsequently. We are not clear as to which is the cart and which is the horse, and that I want you to remember

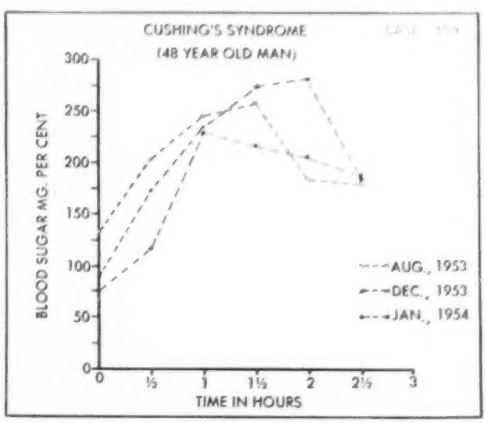

FIGURE 12. Impaired carbohydrate metabolism in Cushing's syndrome.

very clearly. However, we know that the adrenal glands respond to stress, whether it be a burn or a fracture or an infection such as pneumonia, and this is just what I want to demonstrate.

For example, a person who has a severe fracture has a markedly negative nitrogen balance—that is, he loses an increased amount of urinary nitrogen. Associated with that, there is a marked rise of the biologic corticoid levels, which are comparable to those seen in Cushing's syndrome. So that in a perfectly normal individual subjected to stress one gets a response which is largely mediated by the adrenals, and that is most likely the reason for the sodium and chloride retention in the first 24 to 48 hours postoperatively.

The same phenomenon in response to a burn is shown in figure 14. Following the burn there is a negative nitrogen balance, and concomitantly there is a marked rise in the biologic corticoids. One could demonstrate the same picture in a patient with pneumonia or any other severe stress situation. This response is mediated in part by the adrenals, and this is one field in which we

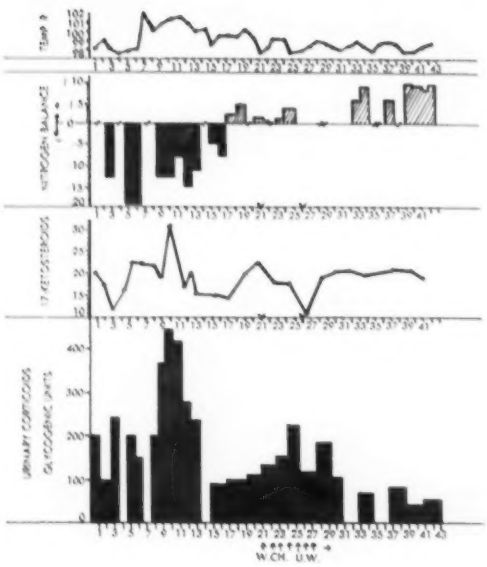

FIGURE 14. Metabolic balance study following a severe burn. Note the negative nitrogen balance and the increased urinary output of 17-ketosteroids and biologic corticoids.

can say that the adrenals are extremely important to the organism's response to stress, used in the widest sense.

The problem arises whether adrenal dysfunction occurs in such related diseases as rheumatoid arthritis, bronchial asthma and similar conditions. We investigated this problem by measuring the 17-ketosteroids and corticoids in the urine of patients with rheumatoid arthritis and bronchial asthma—and this is simply a measure of what their adrenals were producing. Note in figure 15 that the mean of the corticoid excretion in the group of individuals with rheumatoid arthritis lies well below the normal. The same is true for the group with bronchial asthma.

Biologic assay, measuring the adrenal steroid output, shows that in rheumatoid arthritis and bronchial asthma the output of the biologic corticoids in the urine is markedly reduced (figure 16).

As I already mentioned, we do not know whether this is cause or effect, but it suggests that the adrenals either are important in the

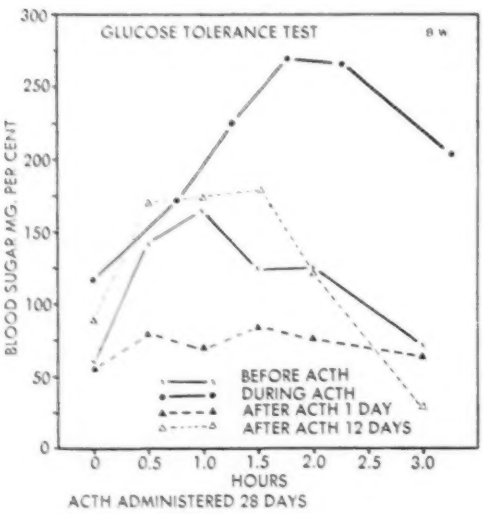

FIGURE 13. Impairment of the glucose tolerance curve in a patient receiving ACTH. Note the flat curve one day after cessation of ACTH, which coincided with symptoms suggestive of adrenal insufficiency.

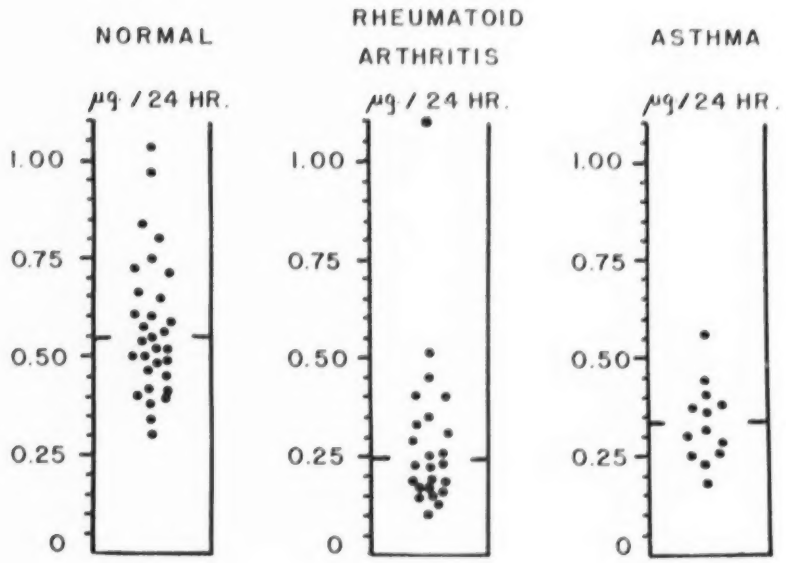

FIGURE 15. Formaldehydogenic corticoid output in rheumatoid arthritis and asthma compared with normals.

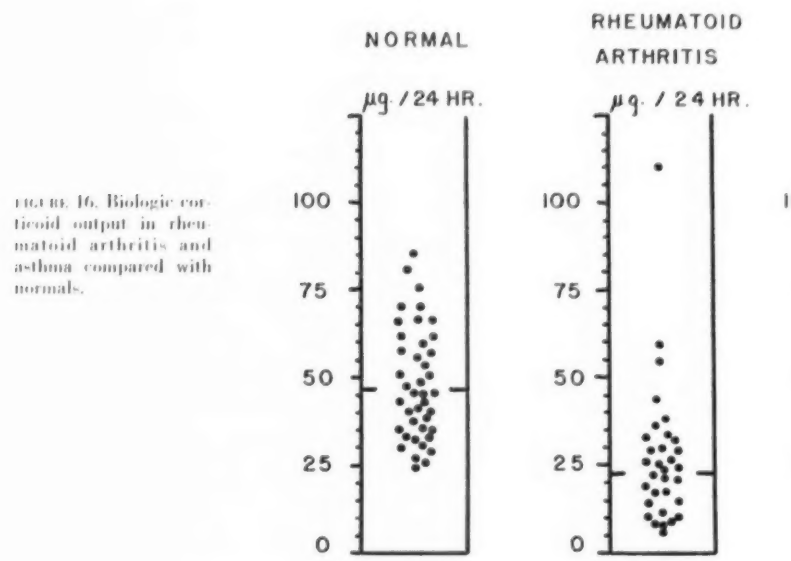

FIGURE 16. Biologic corticoid output in rheumatoid arthritis and asthma compared with normals.

FIGURE 17. Nephrotic syndrome in a three year old boy.

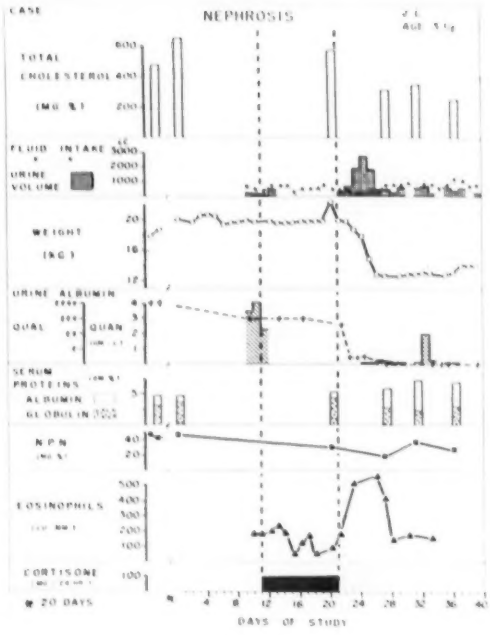

FIGURE 18. Changes in cholesterol, weight, urinary albumin, serum proteins and eosinophils associated with a remission of the nephrotic syndrome which was induced by cortisone.

development of the disease or play some role in maintenance of the disease or the organism's response to it.

Figure 17 shows a little boy whom we saw in 1949. He had nephrosis of two years' duration. We treated him with cortisone. Figure 18 illustrates the changes in weight, urinary albumin and total cholesterol. Following the administration of cortisone there was a marked diuresis, and this patient appeared perfectly normal. He has remained well ever since. This happened to be our first, and that is perhaps why we were so fortunate.

Do the adrenal glands play any role in a disease such as nephrosis? Again I have to say that there are suggestions that they do, but this is by no means proved. You perhaps are all aware that a new adrenal steroid, aldosterone, recently has been isolated which affects sodium retention markedly. The level of this particular substance in the urine is high in nephrosis, congestive heart-failure with edema, malignant hypertension, eclampsia or preeclampsia. We know that in some cases of nephrosis we can reverse this disturbance in physiology by administering either ACTH or cortisone, and perhaps this is because one attempts to restore the balance between the excess production of this mineralocorticoid, which has an effect on water and electrolyte metabolism, and the oxysteroids.

I want to emphasize that this is a hypothesis and we must wait until individual investigators in many different centers try to clarify the whole problem. However, I think we can clearly say that the adrenal glands do play some role in disease. Whether it is the primary, initiating factor in any particular group of diseases or not, we as yet are not certain.

The figures accompanying this clinic are from the slide library of the McGill University Clinic, Royal Victoria Hospital, the staff of which includes Professor J. S. L. Browne and Drs. J. C. Beck, B. Rose, L. G. Johnson, K. R. McKenzie, C. J. Pattee and E. H. Venning.

The Surgical Relief of Pain

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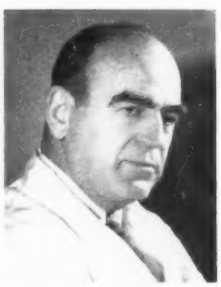
PAIN is probably the most common complaint encountered in medical practice. Two days ago I reviewed the records of the 17 patients on my service who were in that day, and found that 12 complained chiefly of pain. Although this is perhaps a rather highly selective example, since we obviously are apt to have a concentration of such cases, I dare say that in general practice the proportion probably is not very different.



JOSEPH P. EVANS

Two of those patients had metastatic lesions of the spine, one had pain in the neck and arm due to herniation of a cervical disk, three had back pain as a result of herniated lumbar disk, and one had atypical facial pain, an extremely difficult problem to handle. Another of the patients seems to be quite obviously psychoneurotic.

What is pain? I do not have a specific answer to that question. One can find an answer in the dictionary, but I am not at all sure it is universally applicable. This probably is a problem in semantics; pain is something which we do not have words to describe, because it usually is beyond the realm of our ordinary experience.

We can, however, consider what mechanisms produce pain, and there are really four mechanisms responsible for its occurrence: (1) inflammation which stimulates the nerve endings and causes pain; (2) traction—those working in the abdomen under local anesthesia well know that one cannot pull on the mesentery without producing pain; (3) compression such as occurs in neoplasia, but for us in neurologic surgery more commonly exemplified by herniated intervertebral disk with its compression on one of the roots of the sciatic nerve or of the brachial plexus; (4) distention such as distention of the bladder, bowel obstruction and other similar mechanisms. Also very familiar is the exam-

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Presented before the thirty-ninth annual Assembly of the Interstate Postgraduate Medical Association at Minneapolis.

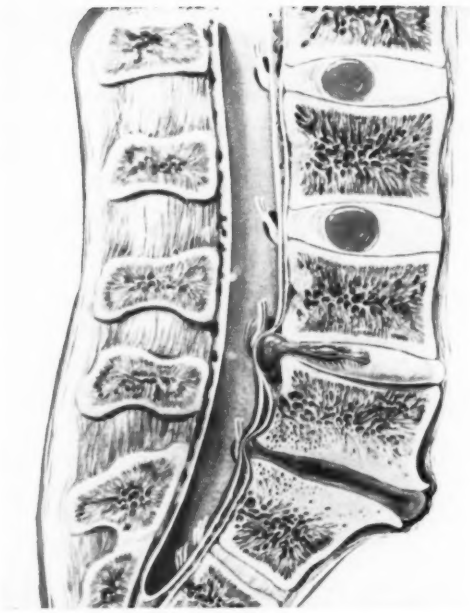

FIGURE 1. Root compression by a herniating intervertebral disk. (Cloward, R. C., 1955, unpublished.)

ple of migraine, the generally accepted explanation of which is that the pain is a reflection of the changing caliber of the intracranial blood vessels, the change in size producing discomfort.

First I should like to point out how it is that a herniated disk, when protruding backward, causes pressure on the adjacent nerve root and, because this contains afferent fibers, gives rise to pain (figure 1).

The point I would like to make in relation to pain is simply that the protrusion of these disks may cause compression on the afferent fibers and give rise to pain in the sciatic distribution or, if the herniation occurs in the cervical area, in the neck and arm.

In many cases of herniated disk, the condition will subside following proper conservative treatment. The original enthusiasm for operative treatment of herniated disks needs to be tempered somewhat. Obviously there are instances in which the disks should be removed, but judgment, in my opinion, should be conservative.

By way of general discussion, I would like to emphasize certain important anatomic points (figure 2). Under abnormal conditions, end-organs may give rise to pain impulses. Under most circumstances it is the free nerve ending which activates the afferent impulse entering the central nervous system, which eventually is interpreted as pain. The pathways are long, and carry the impulses toward

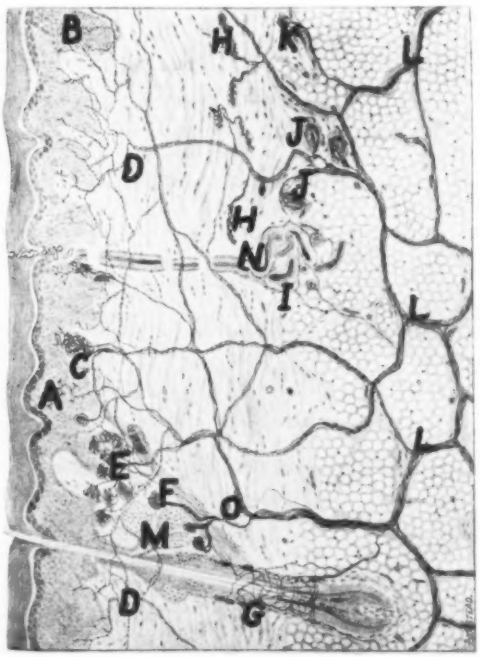

FIGURE 2. Sensory nerve endings. Composite diagram showing the innervation of the human skin. A. Merkel's disks, subserving touch. B. Free endings, subserving pain. C. Meissner's corpuscles, subserving touch. D. Nerve fibers, subserving pain. E. Krause's end-bulbs, subserving cold. F. Nerve endings, subserving warmth (sometimes called Ruffini's endings). G. Nerve fibers and endings on hair follicle, subserving touch. H. Ruffini's endings, subserving pressure. I. Sympathetic nerve fibers innervating a sweat gland. J. Pacinian corpuscles, subserving pressure. K. Golgi-Mazzoni endings, subserving pressure. L. Nerve trunks containing thick and thin fibers. M. Sebaceous gland. N. Sweat gland. O. Sympathetic nerve fibers supplying arrector pili muscle. Drawing composed from methylene blue and reduced silver preparations. The functional interpretations summarized above are based on observations by the writers. (Woollard, H. H., Weddell, G. and Harpman, T.A.: Observations on the neurohistological basis of cutaneous pain. J. Anat. 74:413-440, 1940.)

the thalamic representation, where pain really is experienced. I put this in to emphasize the multiple potentialities for pain on the basis of any one of the four mechanisms involved in its occurrence.

Although we often think of the paravertebral chain as being a motor system, there are, of course, afferent fibers which are distributed to the viscera by way of those widespread fibers of the sympathetic system and, of course, the parasympathetic as well. So there is evidence of well-established pain pathways from all the viscera.

The pain pathways eventually make their way upward by way of the afferent bundles through the medulla and into the thalamic

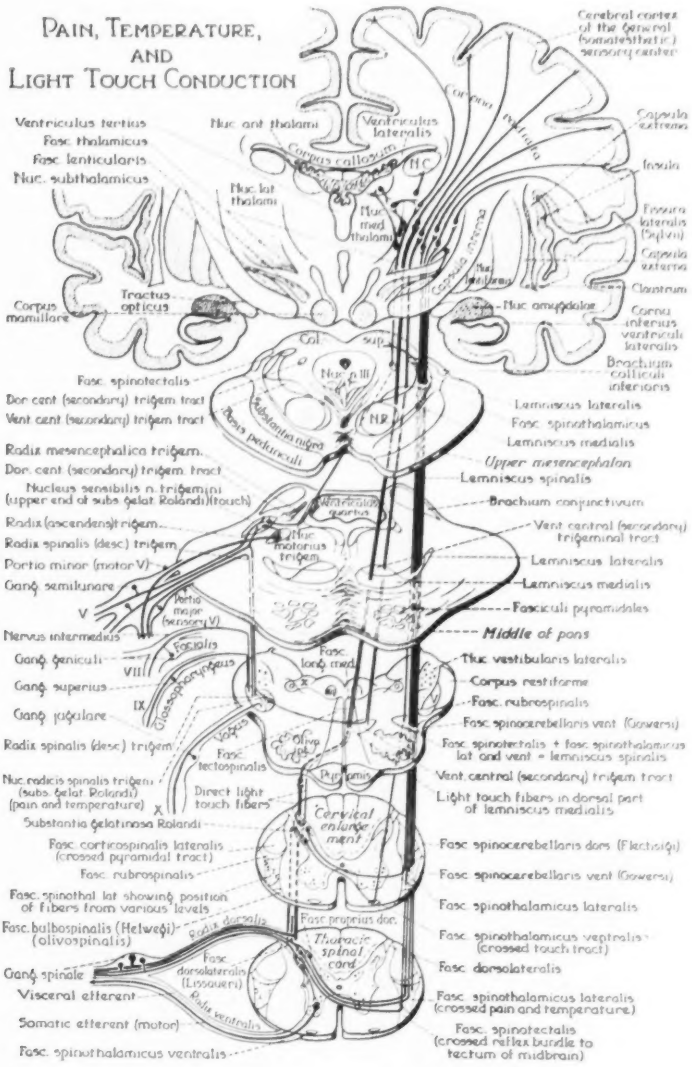

FIGURE 3. Major pathways for conduction of pain. (Rasmussen, A. T.: Principal Nervous Pathways. New York, The Macmillan Company, 1932.)

area (figure 3). But what happens after the pain impulses have arrived at the thalamus, and what it is that elaborates the subjective sensation of pain still are enigmas. A little later I shall say something about the use and abuse of lobotomy in the relief of pain.

Cerebral mechanisms play an extremely important role in the interpretation of pain. A physician whom I know, rather an introspective sort of person, experiences a great many subjective aches and pains. He treats them lightly because he is in a position to interpret whether or not they are significant. His wife almost never experiences pain and almost never has a headache. Here are two people, both reasonably intelligent, one of whom has a great deal of subjective discomfort and the other none. I think this is worth stressing, because the interpretation of pain is really our responsibility as physicians. The layman who comes in complaining of pain often has no idea whatever of its significance and is naturally concerned, unable to interpret it. The physician's role becomes that of going over him carefully and making certain he does not have general disease or, specifically, central nervous system disease. Then the physician must reassure the patient and point out that he may disregard these discomforts, and I think any of us who ourselves have had subjective experiences with pain are well aware of this situation.

Then, again, the philosophic orientation of the patient toward pain has a great deal to do with the degree of suffering he may experience.[1] This is perhaps best brought out by the confusing effect of drug addiction in the presence of long-standing pain. We know how difficult it becomes to interpret pain in such cases, because it seems that one of the effects of narcotics is to destroy these philosophic controls. This may create a basic dishonesty of interpretation.

One of the potent sources of pain is a condition known as causalgia. I cannot go into that subject in great detail, but there is a patient here who demonstrates some of the elements of causalgia and I shall present him briefly. First I would like to make reference to a small manual entitled "Pain Mechanisms," written by W. K. Livingston[2] of Portland, who, I think, handles this problem masterfully, particularly in his description of two patients, the first and second patients in the book, who were suffering from the causalgic type of pain which may follow amputation. I might also mention a new book on pain by James White and W. H. Sweet of Massachusetts General Hospital.[3]

Mr. D., the patient I mentioned, was in an automobile accident in 1937 and was unconscious for three weeks. He sustained an injury to his left leg, a compound fracture, and injuries to his right leg which necessitated three successive amputations. He does not recall clearly at what time he began having pain, but the pain was of two qualities. One was real pain. (To the patient:) Can you describe that to us, Mr. D.? What was the pain itself like?

PATIENT: Something like running a knife right in the foot.

DR. EVANS: That is a pretty good description of pain.

PATIENT: They took off my foot, and it started to hurt awfully bad.

DR. EVANS: There he has introduced the second element of pain. He had had an amputation and yet was having pain in the foot. That is a baffling situation and often creates the belief that the pain is imaginary.

I have asked Mr. D. to tell you something else about his phantom limb, that is, the matter of the itching.

PATIENT: I would reach down to it just like a fly was biting me, or something, and I would feel there wasn't any foot there and would pull my hand away.

DR. EVANS: He told me that one of the reasons he would get his hand away was that he was afraid people would think he was imagining the pain.

The first patient described in Dr. Livingston's book[2] is a physician whose arm had been amputated, but who always had the feeling that his arm was up over his head in a viselike grip and he could not get it free. He asked Dr. Livingston to put his own arm up like that and hold it there. After a few minutes the pain became intolerable, and Dr.

Livingston put his arm down. The patient said to him, "Yes, but you can put your arm down." That patient's pain was relieved by blocking the cervical sympathetic chain, and it seems unquestionable that in his case the painful impulses were being carried in over afferent fibers by way of the stellate ganglion.

Our patient's pain began shortly after his accident in 1937. One reason I consider this an excellent case for our purpose is that it was not realized that something could be done about the pain. Relief has come for Mr. D. by virtue of the fact that he simultaneously had a gastric ulcer. Because of this, he was sent here and treated. The ulcer improved, but as his pain recurred the ulcer got worse. This situation raised the question, might the ulcer be related to his pain? He was seen on the neurosurgical service at the University of Minnesota, and Dr. Lyle French performed a high cervical chordotomy, interrupting the pain pathways that pass by way of the anterolateral tract upward toward the thalamus. The operative procedure was carried out at the C_1, C_2 level. On the left side the cord was divided in its anterior quadrant, and a level of analgesia was produced on the right side, because, as you know, the pain pathways are crossed. A level of analgesia was produced to about C_5; this dropped a little afterward, one or two segments. (To the patient:) Are you free of pain now?

PATIENT: I hardly ever feel it any more.

DR. EVANS: What about the phantom?

PATIENT: That is gone.

DR. EVANS: Here is a brilliant result of chordotomy in a case of a patient who had had continuing pain over a long period.

Two difficulties which followed the procedure are worth mentioning because they are complications which have to be considered. His bladder function was impaired for a time, and he had some weakness of the left arm.

PATIENT: This whole side.

DR. EVANS: But did you have some weakness of the arm?

PATIENT (demonstrating): I couldn't get my arm any higher than this. Now I can get it way up.

DR. EVANS: Those are possibilities which one has to consider and weigh, and yet, obviously, here is a result that is very gratifying indeed. This man was operated on just a year ago. Thank you for coming.

Figure 4 illustrates the operation of anterolateral chordotomy at the upper thoracic level, carried out in this instance on the left side for relief of pain on the right. The operative

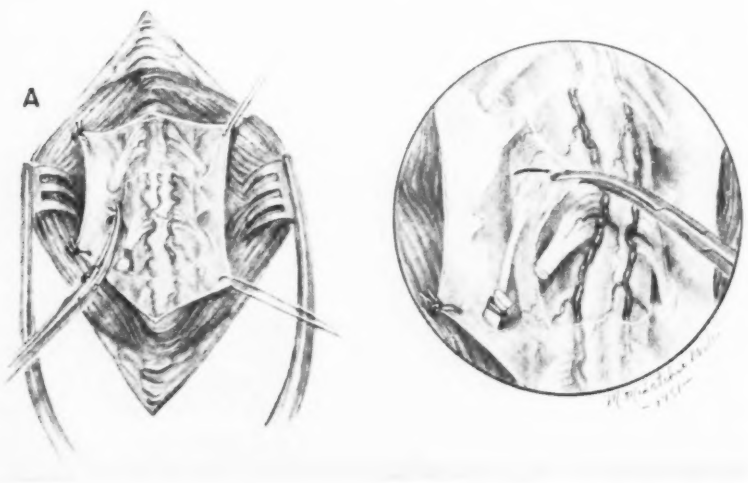

FIGURE 4. Anterolateral chordotomy at upper thoracic level.

A. Details of exposure and rotation of the spinal cord.

B *(right)*. Technic of rotating spinal cord by section and traction on dentate ligament and transection of anterolateral quadrant. (White, J. C. and Sweet, W. H.[3])

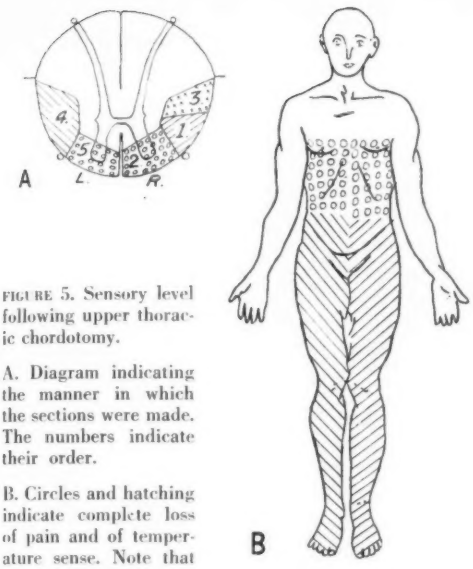

FIGURE 5. Sensory level following upper thoracic chordotomy.

A. Diagram indicating the manner in which the sections were made. The numbers indicate their order.

B. Circles and hatching indicate complete loss of pain and of temperature sense. Note that sections 1 and 4 produce about the same upper level; section 3 had no additional effect, and sections 2 and 5 raised the level to the nipple line.

(Hindman, O.: Possibility of differential section of the spinothalamic tract. Arch. Surg. 38:1036-1055, 1939.)

procedure consists of section which is made roughly in this fashion, dividing the anterolateral tract.

The reason this man had a little weakness (and it was transient, incidentally) is that the pyramidal pathways lie very close to the point at which one begins to make the incision. Also in this general area are presumed to lie scattered fibers which have to do with control of the bladder. Thus it is quite possible to get into serious and permanent difficulty with weakness and bladder disturbance if the operative technic is not carried out skillfully.

For relief of pain in the lower part of the body, the procedure usually is carried out in the high thoracic region. However, one can attain a better level of analgesia by carrying this out either in the high cervical region or sometimes in the low medullary region.

The type of level of analgesia produced when the section is done in the region of the second and third thoracic vertebrae is illustrated in figure 5. This would be a high level to have produced with a section. Very often the level may come at about the umbilical region, but that usually is enough to relieve pain in the lower extremities and also often enough to relieve pain in the pelvis.

Incidentally, the patient whom I presented burned himself one day with a cigarette because of loss of recognition of temperature sense, so one has to be careful about hot water bottles for that reason.

In rare instances, when pain involves the upper cervical region or the face, section may be carried out in the region of the mesencephalon where the lateral tract of the pain-

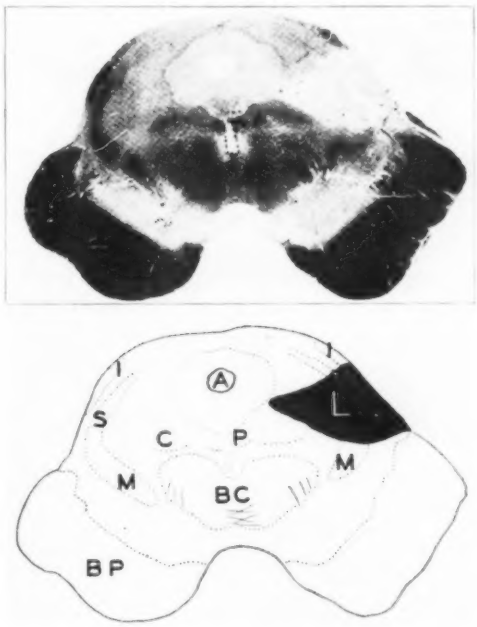

FIGURE 6. Mesencephalic tractotomy. An untouched photomicrograph of a section at the point of maximum damage to the mesencephalon (immediately caudal to the superior colliculus) and a sketch of the section with the tracts labeled: A, aquaeductus Sylvii; BC, brachium conjunctivum; BP, basis pedunculi; C, tractus centralis tegmenti; I, brachium colliculi inferioris; L, lesion; M, lemniscus medialis; P, fasciculus longitudinalis medialis; S, tractus spinothalamicus. The section was stained by Smith-Quigley technic for myelin; x 3. (Walker, A. E.: Mesencephalic tractotomy. Arch. Surg. 44:935-962, 1942.)

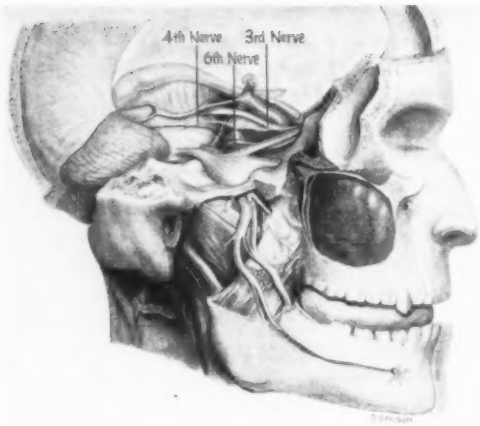

FIGURE 7. The trigeminal ganglion, its root and divisions. A dissection of the cavernous sinus, trigeminus and carotid artery, specially made by Professor Donal Sheehan. (Jefferson, G.: On the saccular aneurysms of the internal carotid artery in the cavernous sinus. Brit. J. Surg. 26:267-302, 1938.)

bearing fibers runs, in the general region illustrated in figure 6. That procedure is not employed very often.

In the time that remains, I would like to turn to a general discussion of cranial nerve section. A representation of a trigeminal nerve entering the base of the skull can be seen in figure 7. Note the first division running to the eye, the second to the mandibular region and the third to the maxillary. This is an operative exposure carried out in the temporal region, exposing the base of the middle fossa. The middle meningeal artery has been divided, and then the dura from over the temporal lobe is pulled back from over the trigeminal ganglion and the root is exposed just before it leaves the middle fossa to enter the mesencephalon.

Trigeminal neuralgia is a frightful condition, characterized by intermittent, recurrent bouts of pain of great severity. Often the patient suffers miserably and may even be unable to eat because movement of the jaw may produce pain. There are certain temporizing measures which may be carried out, and, since the disease is a remitting one, a patient may have long periods of freedom. However, in some instances pain becomes intractable, and under those circumstances there are maneuvers which may be carried out. One reason for my mentioning this is that one still finds that patients are sometimes told, "Oh, no, you must not have your nerve root cut, because you will have facial paralysis, you will have trouble with your eye," and so on. Under modern circumstances, with careful technic, the complications following trigeminal rhizotomy are few. Patients who have had trigeminal neuralgia and have undergone op-

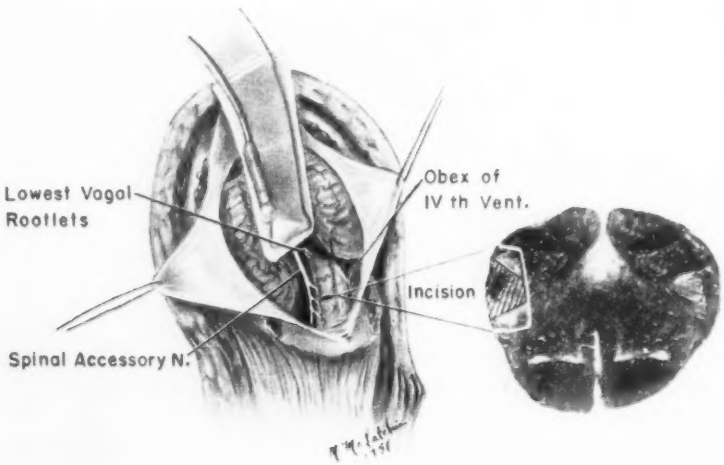

FIGURE 8. Medullary section of descending trigeminal root. Insert from Grant and Weinberger, reversed, shows incision below obex recommended by them (oblique black lines) and somewhat more extensive incision preferred by us [White and Sweet[3]] (shown by white line). We prefer, when the vascular pattern in the pia permits, to make the cut at the cross-sectional level of the obex rather than below it as shown in the illustration. (Figure 61, from White, J. C. and Sweet, W. H.[3])

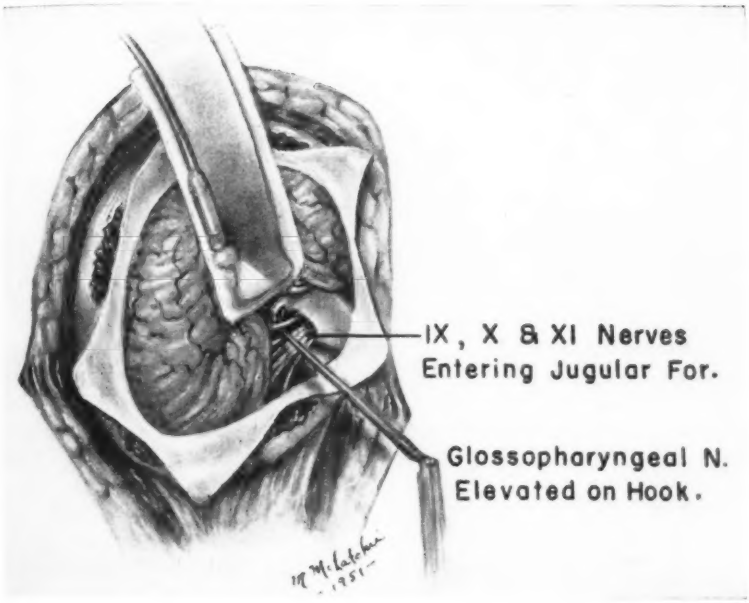

FIGURE 9. Glossopharyngeal neurectomy. The glossopharyngeal nerve is shown as a single root, somewhat larger than the individual vagal rootlets. This is the way it appears to the surgeon. Actually, when examined with a magnifying lens in a postmortem specimen, one can see that what looks like a single root can be separated into a number of tiny rootlets. (Figure 75, from White, J. C. and Sweet, W. H.[3])

eration are in most instances among the most grateful patients we have.

It is possible to do a differential section and spare the motor root which runs behind the sensory root obliquely across down into the third division. If the pain is in the first division, which is unusual, those fibers can be cut. More often the pain is in the second and third divisions, and one does a differential section, leaving the first division fibers. Figure 7 also shows the general relationships of that ganglion to other structures which lie in this vicinity—the third cranial nerve, the fourth, and the sixth.

It is possible to use an alternate approach if it should prove necessary for technical reasons. One approaches the trigeminal root from under the cerebellum and divides it after it enters the posterior fossa, picking up the nerve root at this point. There are certain technical difficulties in connection with that procedure, but there are occasions when it is an alternate route of value. Also worth pointing out is that occasionally one may want to divide cervical roots, as in the handling of intractable pain associated with carcinoma of the face and neck.

There is still another way to relieve trigeminal pain. You will recall that the pain fibers descend in the medulla for a long distance. It is possible to divide those pain pathways within the medulla, as indicated in figure 8, where the cerebellum is retracted and the lower end of the medulla is exposed, and at this point one may make an incision and divide the sensory fibers within the medulla. This procedure has the advantage that one can relieve pain without producing loss of touch sensation in the face, since the touch fibers enter at a higher level and do not descend with this descending root of the fifth.

Figure 9 demonstrates the method of handling an allied condition, glossopharyngeal neuralgia, which is much like trigeminal neuralgia except that the distribution of the glossopharyngeal nerve is affected and therefore there is lancinating, intermittent pain referred to the throat and sometimes the ear. Here one makes a similar exposure, and in figure 9 you can see the ninth root being divided after the cerebellum has been retracted for exposure. This procedure results usually in minimal sensory loss and is very effective in relieving this neuralgic difficulty.

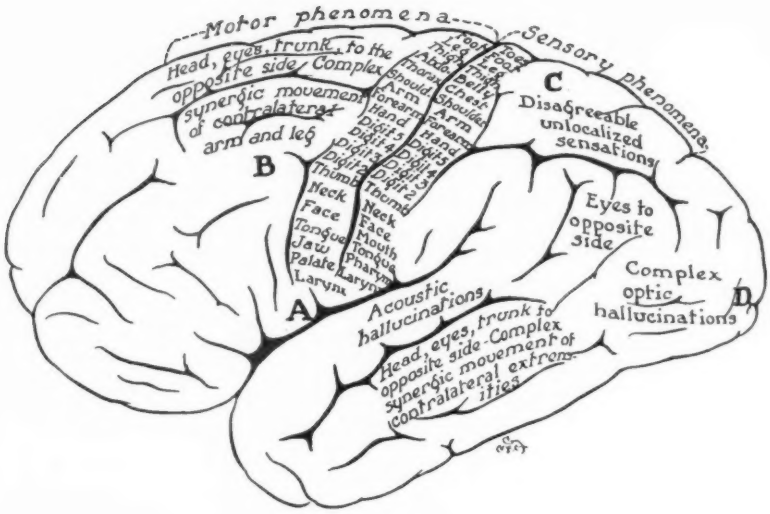

FIGURE 10. Areas of cortical function. (Figure 26, from Bailey, P.: Intracranial Tumors. Springfield, Illinois, Charles C Thomas, 1933.)

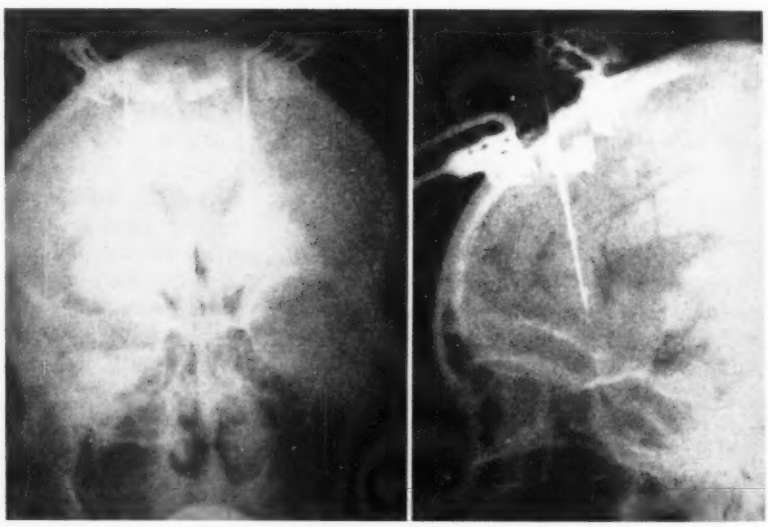

FIGURE 11. Grantham lobotomy. *Left:* An anteroposterior x-ray shows the correct placement of the electrodes in relation to the sagittal plane and to the anterior horns of the lateral ventricle. In this instance, the electrodes are at a depth of 4.5 cm. below the surface of the cortex and lie 2 cm. from the midline. *Right:* A lateral x-ray shows the two electrodes in the same plane and at the proper distance rostral to the anterior horn of the lateral ventricle.

(Figures 1 and 2, from Grantham, E.: Prefrontal lobotomy for relief of pain, with a report of a new operative technique. J. Neurosurg. 8:405-410, 1951.)

Here we might bring up the question of handling intractable pain associated with carcinoma of the neck and jaw. Very often, the major problem in the later stages of this disease is that of providing relief from pain. It is possible, by means of this type of approach, to divide the ninth root, to reach up under the cerebellum and find the fifth as it enters the stem, and at the same time to extend the opening downward into the upper cervical region and divide the posterior root at that level. The first posterior root, the sensory root, usually is absent, so one divides the second and the third. Although it is not possible to relieve all the pain in these instances (at least that has been my usual experience), it

is sometimes possible to make a very considerable difference in the patient's comfort.

Now I want to say a word or two about interpreting pain and about lobotomy. The drawing in figure 10 is, I am sure, familiar to all of you. It indicates the general areas of function in the brain. In the frontal region there is a body of activities which is now being explored very extensively. Among these activities is that of interpretation of pain.

Some years ago, Freeman and Watts were struck by the absence of pain postoperatively in a case in which they had performed lobotomy. The patient had a psychosis and also had carcinoma of the breast. The pain associated with the carcinoma was absent. They wondered whether perhaps one could relieve pain by lobotomy. That idea has since been extended. If one places an electric needle into the region of the central medial quadrant of the frontal lobe, from above downward, one produces in many cases a state of relative freedom from anxiety in relation to the pain (figure 11). When you remove the sutures from the scalp wound after lobotomy, the patient will wince, but a moment later, if you ask him if he has pain, he will say, "No," even though he may have had severe pain beforehand. In most instances this is not really a very effective or long-lasting way of relieving pain, although occasionally, with considerable blunting of the personality, a rather protracted effect may occur.

We are beginning to learn something about the interpretive mechanism for pain, and with further elaboration and studies we may be able to understand more clearly what pain is. What one seems to do with lobotomy is to relieve any anxiety the patient has, the capacity of projecting into the future the problems which his malignancy presents.

While coming here on the plane, I happened on a comment of my former chief, Wilder Penfield, in Edward R. Murrow's book, "This I Believe." He made this statement (this was, of course, written for the lay press, so it is in simple terms): "It is possible for us to trace much of the nervous action that carries information inward into the brain and to record the nerve impulses that pass outward to produce voluntary activity, but we are quite ignorant of how nerve action is transformed into thought and how thought is converted into nerve action." Is this, then, perhaps not really the crux of the problem of interpretation of pain? Is this not wherein lies the art rather than the science of medicine? A sympathetic understanding of patients who have pain does much to alleviate their concerns and their suffering.

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DIAGNOSTIC CLINIC

Cancer of the Breast

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So much has been said at this Assembly on the subject of breast cancer that I scarcely know what to discuss. In fact, the problem has been very well covered. I was greatly impressed with the able and courageous presentation by Dr. George Crile[1] in which he warned against some of the superradical surgery being done, and I was particularly interested in what he said about invoking the law of diminishing returns. I thought it might be of interest to give you a few thoughts which might stabilize our basic thinking in the choice of treatment.

The management of carcinoma of the breast has become a highly controversial problem in recent years. Statistics are bewildering and contradictory. Pessimism continues to dominate the thoughts of the majority of those dealing with the disease. Frequent references are made to Daland's[2] important observations that 22 per cent of patients will live five years without treatment of any kind; therefore, it is argued, we have gained little through surgery and irradiation.

About three years ago Park and Lees,[3] discussing the absolute curability of cancer of the breast based on a five year survival rate standard of cure, concluded, "It has not been proven that the survival rate of cancer of the breast, using the five year survival rate as an index, is affected by treatment at all." The validity of many of their assumptions has been questioned from time to time, but the impact of the article on the medical profession in general has been profound.

It is true that the absolute curability of cancer is little affected by any available procedures. The cure of cancer will not occur until the biochemistry of normal cells and cancer cells is completely understood. How-

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Presented before the thirty-ninth annual Assembly of the Interstate Postgraduate Medical Association at Minneapolis.

ever, radical excision of cancer may bring complete freedom from the disease, often for many years, and in my opinion is definitely indicated at this time.

Again, it is pointed out that surgical procedures are unduly radical, and that equally good results may be obtained by simple mastectomy and irradiation. I refer to McWhirter's[4] observations. May I suggest that those who hold these convictions look back to the two decades before Halsted to rediscover the dismal failures of conservative surgery. Local recurrences were recorded in 51 to 82 per cent of the cases by the master surgeons of that period. The operation performed at that time was the procedure introduced by Volkmann in 1875, simple mastectomy with removal of the anterior fascial sheath of the pectoralis major muscle. Valpeau reported five year survivals in only 7 of 187 cases, and this experience was common to all observers. In 1894, Halsted recorded 6 per cent local recurrences, and steady progress has been made since that time.

Recently Harrington[5] reported the follow-up results in a very large series of patients operated on by the usual radical procedures. If we pass by the five year survival group and look into his report for 15 year survivals, we find that in the over-all picture, 25 per cent of the patients were still alive. In cases without axillary node involvement, 48 per cent or nearly half of the patients were alive after 15 years, but only 12 per cent of those with axillary node involvement survived. In the light of these observations, I cannot share the discouragements so frequently expressed in the literature, nor can I agree with McWhirter's conclusions.

It is true that x-ray therapy was not used in the pre-Halsted days, but irradiation does not completely destroy cancer of the lymph nodes and therefore it contributes only a delaying action. Let us wait for a "second look" at the results in McWhirter's presently recorded cases in 10 to 15 years before accepting this procedure as satisfactory.

Figure 1 indicates the results in a series of 503 private patients in whom I have been personally interested, most of whom I have operated on myself and all of whom I have personally followed. The figures are approximately the same as those found in many other published reports. Of the patients without axillary node involvement, about 80 per cent were alive after five years. The over-all picture is about 54 per cent. (This figure varies from 45 to 55 per cent in various reports, depending on the type of hospital in which the statistics were compiled.) With axillary node involvement, only 33 per cent were alive after five years. The lower line indicates the observations of Daland, and shows a five year survival rate of 22 per cent if nothing at all is done.

There has been a great deal of comment about the five year survival rate and its misleading effect. Actually, if the postoperative death rate is carefully charted, you will find that 75 per cent of the patients who fail to survive will die within the first three years, and then the curve falls off rapidly. Therefore, I do not believe the generally adopted five year period is altogether bad for statistical purposes as a guide in estimating the value of surgical procedures. When x-ray therapy is a major factor, or when no therapy at all is adopted, the five year survival rate becomes exceedingly misleading.

I have tried to give you the thinking of a large section of the medical profession who feel that management of cancer of the breast has been unduly radical. We are now confronted with the appraisal of a wave of more radical surgery for breast cancer than the gen-

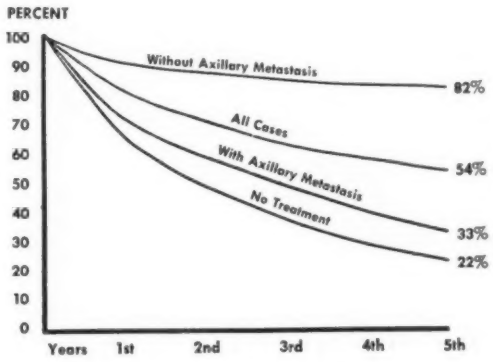

FIGURE 1. Results in treatment of breast cancer.

erally accepted Halsted or Willy Meyer operations provided. Urban and Baker,[6] among others, are re-examining our thinking regarding the importance of metastatic invasion of the internal mammary chain of lymph nodes. They have described their radical en bloc resection of these nodes in continuity with the usual radical breast resection. Here in Minneapolis, Dr. Owen Wangensteen has gone one step further and includes in his superradical resection the supraclavicular nodes.

The internal mammary drainage route of lymphatics from the medial and central breast areas has long been known and described. We associate the names of Halsted and W. S. Handley with the pioneer work in this field. Resection of these lymph nodes in the past failed to contribute anything of importance in the survival rates and was therefore abandoned. Recently revived enthusiasm for their removal, either for prognostic or for curative purposes, has been stimulated by the careful studies of R. S. Handley and A. C. Thackray,[7] McDonald, Haagensen and Stout,[8] and others.

McDonald and associates proposed a triple biopsy before doing a radical operation in carcinoma of the breast with axillary node involvement. Their procedure consists of the removal, for microscopic study, of a portion of (1) the primary lesion (to confirm the diagnosis), (2) the internal mammary chain node, removed through the second intercostal space along the sternum, and (3) the supraclavicular nodes. They point out that hope is gone and radical surgery is not indicated if the upper node in the internal mammary chain is involved, or if the supraclavicular nodes are involved. Internal mammary node involvement has been shown by R. S. Handley, McDonald and associates, and others to be much more frequent when axillary nodes are involved. This may be due to retrograde drainage after the axillary channels are blocked.

The superradical resections are still in the experimental stage and should not be taken lightly as a routine means of cancer removal by any surgeon not experienced in the field.

With the various procedures now under discussion, it becomes difficult to choose the correct operation in a particular case. Until some biochemical method of cancer control is discovered, we shall be compelled to resort to the rather crude methods now available for its removal or destruction. Certain observations, however, have come to light over the years that will guide us to a degree:

1. The behavior of cancer of the breast is entirely unpredictable. A small nodule recognized a few weeks before the patient is first seen may result in her death from cancer within two years. A large, ulcerating, sloughing cancer of the breast, which clinically suggests a hopeless prognosis, may, if radically removed, result in 10 or more years of life and freedom from the disease. All physicians with wide experience in this field have seen this happen.

2. I wish to say just a word about the duration of the cancer before operation, in its relation to prognosis. Actually the length of time the lesion has existed does nothing, statistically at least, to influence the five year survival rate. Table 1 records the relationship between the duration of cancer and the five year survival. Note that nodules recognized for two months or less carry a five year survival rate of 57 per cent, and those present for two years or more have practically the same survival rate. This observation has been reported by others. The reason for the apparent paradox is obvious. Highly anaplastic types of cancer grow rapidly; the patient recognizes them more quickly and comes to the doctor more promptly. The lesion is dealt with immedi-

TABLE 1

DURATION OF CANCER BEFORE OPERATION IN RELATION TO FIVE YEAR SURVIVAL (240 UNILATERAL CASES)

DURATION (MONTHS)	PATIENTS		FIVE YEAR SURVIVAL	
	Number	*Per Cent*	*Number*	*Per Cent*
0-2	115	47.9	66	57.4
3-4	32	13.3	14	43.7
5-6	21	8.7	11	52.0
7-12	41	17.0	20	49.0
13-18	8	3.3	4	50.0
19-24	12	5.0	6	50.0
25+	11	4.5	6	54.0

ately. The highly differentiated type, on the other hand, often exists a long time before it is recognized. The patient pays little attention to it because of its slow growth and will wait longer before becoming alarmed. The ultimate result, of course, depends on body chemistry. Highly differentiated cancer cells are apparently resisted more effectively by normal body tissues, while the highly malignant ones grow rapidly and metastasize early.

3. The size of the lesion, however, presents quite a different picture, as you will see in table 2. Note that the smaller the lesion, the better the prognosis—which, unlike the above observations, seems more logical.

4. Again statistically, the highly anaplastic types of cancer show a lower percentage of

TABLE 2

SIZE OF BREAST CANCER IN RELATION TO FIVE YEAR SURVIVAL (249 UNILATERAL CASES)

SIZE (CM.)	PATIENTS		FIVE YEAR SURVIVAL	
	Number	*Per Cent*	*Number*	*Per Cent*
1	16	6.4	13	81
2	77	31.0	58	75
3	72	30.0	35	48
4	31	12.4	13	42
5	24	9.6	7	29
6	6	2.4	2	33
7	7	2.8	2	28
8+	16	6.4	3	19

five year survivals than do the highly differentiated types, yet we may be wrong in our prognosis in from 10 to 15 per cent of cases.

5. It has long been established, as already pointed out, that the five year survival rate with axillary node involvement is only about 35 per cent, while 80 per cent or more of patients without axillary node involvement will live five years or longer postoperatively. This I think is the most important single prognostic factor which we have to guide us.

It is on the basis of these observations that the proponents of simple mastectomy and irradiation made their plea for this procedure. In addition they point out that if nothing at all is done, 22 per cent of the patients will live five years (Daland[2]), and ask, "What have you gained?" In answer, may I point out that there is no known way to recognize the extent of cancer spread except in the obviously inoperable cases. It is true that if the lesion is localized, simple mastectomy should cure it, but there is no known method of proving the absence of spread. Palpation of the axillary nodes is notoriously inaccurate and distant metastases cannot be discovered until late. Furthermore, it has been well established that 35 per cent of patients with axillary node involvement survive five years. We also know that when axillary nodes are not removed, as in simple mastectomy, axillary metastases may appear as late as 10 to 20 or more years after operation. For these reasons, it has been my conviction that radical breast resection of the modified Halsted or Willy Meyer type should always be done in breast cancer, except in the inoperable cases which include "inflammatory" cancer (mastitis carcinosa) and in patients who refuse operation. The mortality rate for radical resection is negligible in competent hands. The deformity is not much greater than that following simple mastectomy, and the psychogenic factor is the same. The complications, such as edema of the arm, are not more common than in patients with extensive irradiation which often consists of 3500 r or more applied to each of three different areas. In addition there is the advantage of removing all axillary nodes, which, if they are involved and extension beyond them has not occurred, will result in long survival. When there is axillary node involvement, as determined by a competent pathologist, x-ray therapy may be an additional safeguard.

The superradical operation should be approached with caution by the average surgeon since the morbidity and mortality resulting from these difficult procedures might invoke the law of diminishing returns. The surgical objective should be directed toward complete removal of the lesion if possible, palliation when necessary, and protection of the patient against needless mutilation and disability.

The illustrations which accompany this

FIGURE 2. Breast of a patient whose only complaint was bleeding from the nipple.

paper are presented to emphasize some of the observations I have been trying to make. In figure 2 can be seen the breast of a patient whose only complaint was bleeding from the nipple. No nodule of any kind could be felt. After a biopsy was done, ductal adenocarcinoma of a highly differentiated type was found. It was apparently limited to a small area. For this reason simple mastectomy was done with the hope of complete removal of the malignant lesion. During the past year, 11 years after the first operation, nodules were felt in the patient's axilla on the side of the mastectomy. Following radical resection of the axillary nodes, grade 2 adenocarcinoma was found. The prognosis now is bad. Had a radical resection been done 11 years ago, this patient could look forward to many more years of good health, at least until a new primary lesion occurred in some other part of the body. This is where statistics let us down. Figures may show an 80 per cent favorable result in this case, but if we do not use good judgment on the basis of experience, our failure becomes 100 per cent for the patient.

Another rather innocuous-looking breast is

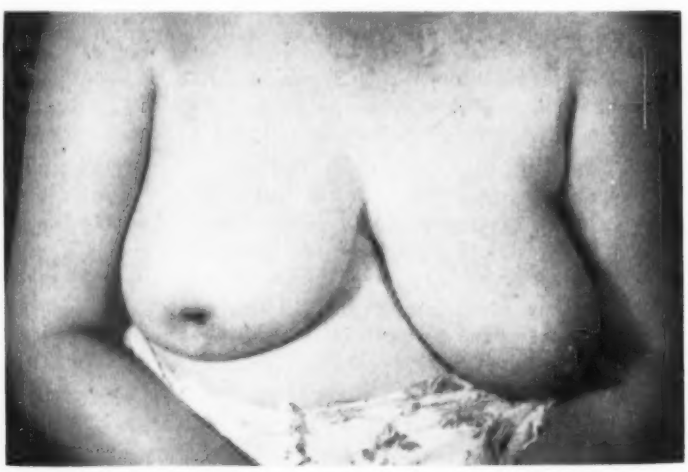

FIGURE 3. An innocuous-looking breast, with dimpling of the nipple and a firm, fixed nodule beneath it.

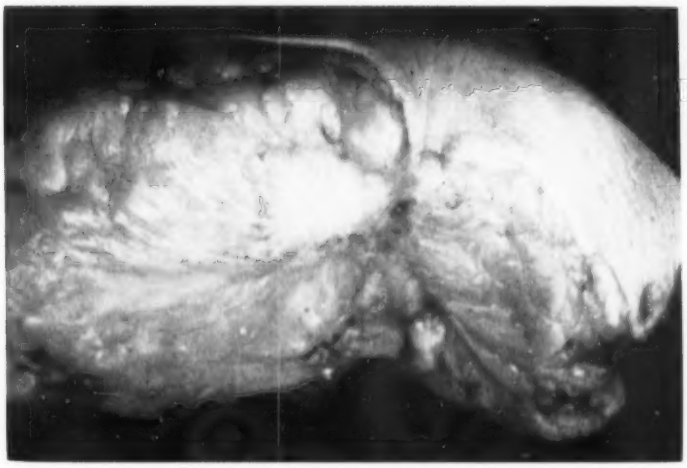

FIGURE 4. Cut section of the breast shown in figure 3.

pictured in figure 3, with dimpling of the nipple and a firm, fixed nodule beneath it. Axillary nodes could not be clearly felt. A good prognosis might well have been anticipated. Radical resection of the breast was done, and grade 3 adenocarcinoma with involvement of three lymph nodes was reported by the pathologist. Postoperative irradiation was instituted, but this patient died one and a half years later of generalized carcinomatosis. Again this emphasizes the unpredictability of breast cancer.

Figure 4 shows the cut section of the breast I just discussed. It will give you an idea of how extensive the innocuous-looking lesion turned out to be.

Figure 5 illustrates just the opposite problem. This patient had noticed a "lump" in her breast two years before she came to the hospital. A radical resection was done because this tumor was not fixed, and there was no evidence of any distant metastatic involvement. The axillary nodes, however, could be palpated. She lived about five and a half years postoperatively. During the last year of her life she responded well to androgen therapy.

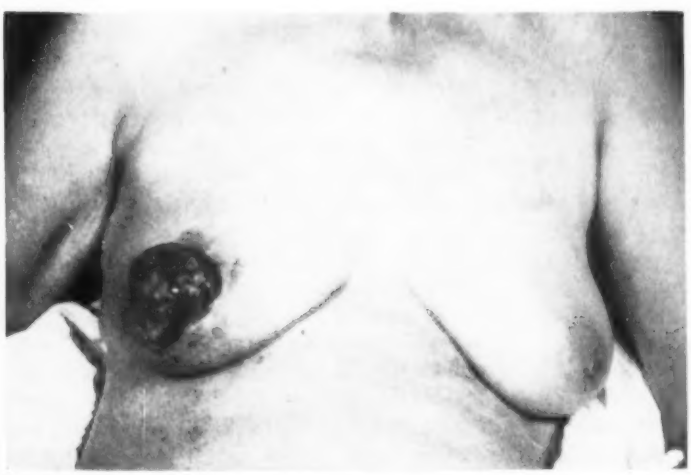

FIGURE 5. Breast of a patient who had noticed a "lump" in her breast two years before she came to the hospital. Radical resection was done because tumor was not fixed and there was no evidence of distant metastatic involvement.

FIGURE 6. Breast of a patient in whom cancer had existed for over four years; patient had refused operation because of religious convictions.

FIGURE 7. Postoperative section of the breast shown in figure 6.

She ultimately died of pulmonary carcinoma. At present, since she was steroid-dependent, I think we would do bilateral oophorectomy and adrenalectomy which might prolong her life in comfort for some time. Again we see how difficult it is to anticipate the outcome.

The lesion in figure 6 is the type we often refer to in our group as "Christian Science" cancer. It was known to exist for over four years, but the patient refused surgical removal because of religious convictions. Finally she wanted it removed because of pain and the "nuisance" of a sloughing, discharging ulcer, but she lived only two years after the operation. Postoperative x-ray therapy was used. Surgical removal gave her local comfort but the ultimate prognosis was obviously hopeless. This might well have been recorded as a five year survival without surgical aid. However, had she been operated on at the outset, a survival of many years could have resulted.

A section of the cancer as it appeared postoperatively can be seen in figure 7.

The type of cancer we should never operate on, the "inflammatory" type of breast cancer, is shown in figure 8. These patients frequently come to us having had penicillin,

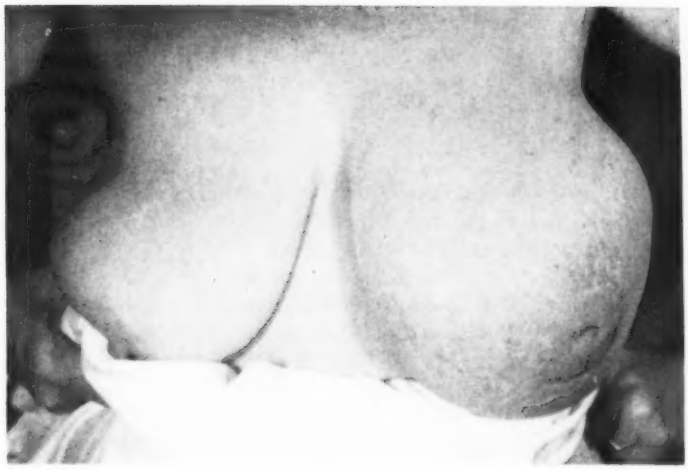

FIGURE 8. "Inflammatory" type of breast cancer which can only receive palliative x-ray therapy.

FIGURE 9. Average woman of medium build who has had a radical resection. Photograph illustrates degree of usual deformity.

FIGURE 10. Same patient as shown in figure 9 showing no impairment of normal motion following radical resection.

streptomycin and hot packs for some time. Nothing will help them except x-ray therapy. Many of them respond well for a short time, but the prognosis is hopeless.

A great deal is said about the deformity resulting from radical operation on the breast. Figure 9 is a photograph of just an average case, a woman of medium build, who has had a radical resection. You will note that the deformity is scarcely any greater than might be expected following simple mastectomy.

Figure 10 shows the same woman with outstretched arms; there is no impairment of normal motion.

I had hoped to make a few remarks on the palliative use of hormones in steroid-depend-

ent cancers, as well as on the monumental work of Dr. Charles Huggins in the use of adrenalectomy, but time does not permit me to do so.

Summary

There is much confusion in our thinking, as expressed in the medical literature, regarding the proper treatment of breast cancer.

Since we have not yet achieved any biochemical means for dealing with the disease satisfactorily, and since the behavior of a given case of breast cancer is entirely unpredictable, we are compelled to continue radical surgical removal. By this means, we will salvage a maximum number of doubtful cases.

Accurate diagnosis of cancer spread through the lymphatics or the blood stream cannot be made in many patients. Therefore, radical surgery should always be used except in inoperable cancer, mastitis carcinosa, and when operation is refused by the patient.

Triple biopsy as proposed by McDonald and Haagensen should prove to be of great value in selecting operable cases.

Superradical surgery should be left to those now re-exploring the field, lest higher mortality and morbidity rates result than those which accompany presently accepted methods.

Irradiation is of value in all cases of axillary node involvement after radical surgery, and, of course, in inoperable and "inflammatory" cancer.

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Books Received

New books received are acknowledged each month. As space permits, books of principal interest to our readers will be reviewed more extensively. Reviews will be found starting on page A-98.

The Postural Complex; Observations as to Cause, Diagnosis and Treatment. By Laurence Jones, M.D., Visiting Orthopedist, Midway Hospital, Los Angeles. 152 pages with 79 illustrations. 1955, Charles C Thomas, Springfield, Illinois. $9.75.

Clinical Pathologic Conferences of Cook County Hospital; Cardiovascular-Renal Problems. Edited by Hans Popper, M.D., Director, Department of Pathology, and Daniel S. Kushner, M.D., Associate Director of Medical Education, Cook County Hospital, Chicago. Vol. 1. 324 pages, illustrated. 1954, The Blakiston Division, McGraw-Hill Book Company, Inc., New York, Toronto and London. $5.00.

Roentgen Interpretation. By George W. Holmes, M.D. Honorary Physician and Laurence L. Robbins, M.D., Radiologist-in-chief to the Massachusetts General Hospital, Boston. Ed. 8. 525 pages with 371 illustrations. 1955, Lea & Febiger, Philadelphia. $10.00.

Cancer and Common Sense. By George Crile, Jr., M.D., Surgical Staff, The Cleveland Clinic, Cleveland. 118 pages. 1955, The Viking Press, Inc., New York. $2.75.

Problems In Amoebiasis. By Charles William Rees, Ph.D., Head, Section on Protozoal Diseases, Laboratory of Tropical Diseases, National Microbiological Institute, National Institutes of Health, United States Public Health Service, Bethesda, Maryland. 119 pages, illustrated. 1955, Charles C Thomas, Springfield, Illinois. $4.75.

Operative Technic. Edited by Warren H. Cole, M.D., Professor of Surgery and Head of the Department, University of Illinois College of Medicine, Chicago. With 67 contributors. Ed. 2. 973 pages, illustrated. 1955, Appleton-Century-Crofts, Inc., New York. $20.00.

Clinical Biochemistry. By Abraham Cantarow, M.D., Professor of Biochemistry, Jefferson Medical College, Philadelphia, and Max Trumper, Ph.D., formerly Lecturer in Clinical Biochemistry and Basic Science Coordinator, Naval Medical School, National Naval Medical Center, Bethesda, Maryland. Ed. 5. 738 pages with 54 illustrations. 1955, W. B. Saunders Company, Philadelphia and London. $9.00.

Surgical Emergencies in the Newborn

COLIN C. FERGUSON*

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I SHALL review briefly some of the surgical emergencies due to congenital defects that arise in the newborn period. In general, if these conditions are not recognized and adequately treated early in life, the child will die.

COLIN C. FERGUSON

Esophageal Atresia

The University of Minnesota has very kindly supplied me with a patient. This little boy is three years of age (figure 1). He was born November 1, 1951, following a normal pregnancy and delivery. He weighed 8 lb., 2 oz. at birth and seemed perfectly normal in all respects. The obstetrician, however, noticed that he had an excess of mucus in the back of his throat. It was thought that he had aspirated some amniotic fluid, and he was put in a special nursery in the Minneapolis Maternity Hospital. In the nursery, suction was required several times because of mucus in the back of his throat. On the second day when a feeding of glucose water was started he took it hungrily and then suddenly started to splutter and choke. He turned blue and coughed up the feeding.

On the third day, when this condition had persisted, the pediatrician became suspicious that something was seriously wrong and he immediately thought of an esophageal obstruction. He passed a No. 8 or 10 rubber urethral catheter down through the infant's nose in an attempt to put it into the stomach. It stopped at about the level of the midchest and would not go down into the stomach. The doctor then thought that the child had esophageal atresia.

Esophageal atresia is a congenital absence of the midportion of the esophagus (figure 2). It can occur as an isolated entity, but more commonly there is some sort of tracheo-esophageal communication. Of all children born with esophageal atresia, more than 95 per cent have a blind-ending upper esophageal segment and a distal tracheo-esophageal communication. The other abnormalities pictured in figure 2 occur very rarely.

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Presented before the thirty-ninth annual Assembly of the Interstate Postgraduate Medical Association at Minneapolis.

FIGURE 1. Postoperative photograph of three year old boy who underwent surgery at the University of Minnesota Hospitals for correction of esophageal atresia with tracheo-esophageal fistula.

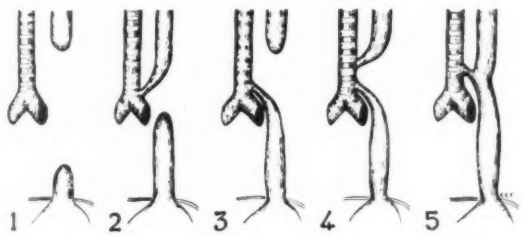

FIGURE 2. Diagram showing types of esophageal atresia with associated tracheo-esophageal fistulas. Type 3 is the most commonly encountered type.

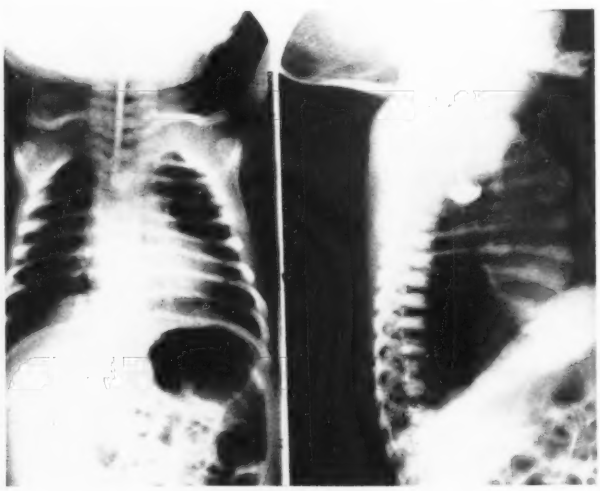

FIGURE 3. Anteroposterior and lateral roentgenographic views of the chest, showing the proximal esophageal segment outlined by Lipiodol. The presence of gas in the intestine indicates that there is a communication from the trachea to the distal esophageal segment.

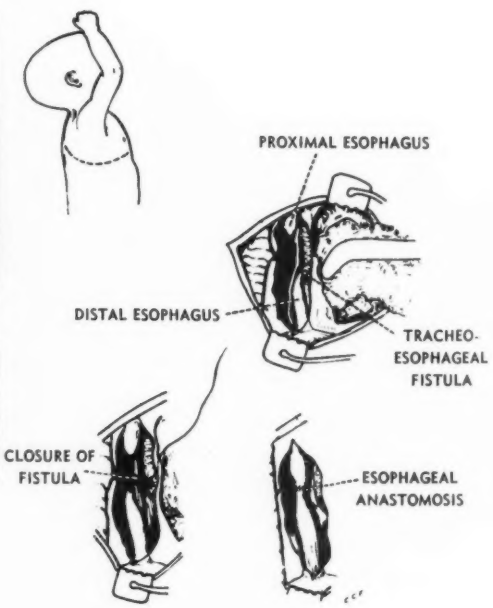

FIGURE 4. Drawing showing the operative procedure performed. The tracheo-esophageal fistula was divided and its tracheal end closed. A primary anastomosis of the two esophageal segments was then carried out.

The doctor knew that this boy had esophageal atresia because the catheter would not go down into the stomach. To find out more about the child, he took the roentgenogram in figure 3. He left the catheter in the proximal esophageal pouch and then introduced 1 or 2 cc. of LIPIODOL®, being careful not to overfill the esophageal pouch. This showed that the esophagus was ending blindly and confirmed the diagnosis. The gas-filled stomach and intestine indicated that there must be a distal esophageal-tracheal fistula communicating with the intestine.

In preparing the child for surgery, continual suction was applied to the esophageal catheter, thus preventing an accumulation of saliva. The child was given an injection of penicillin, and vitamin K to prevent any hypoprothrombinemia. His head was elevated slightly to minimize regurgitation from the stomach up through the distal esophagus into the trachea. Then he was transferred to the University of Minnesota Hospital where surgery was performed by Dr. F. J. Lewis.

At surgery the child was positioned on the operating table with the right chest uppermost. The chest was opened, the lungs were retracted anteriorly, and then the proximal esophagus and the distal esophagus were identified. The fistula extended into the trachea as shown in figure 4. The pleura overlying this region was incised and the dissection of the esophageal segments begun.

The surgeon divided the tracheo-esophageal fistula and closed the tracheal opening. Then, having freed up both esophageal segments, he made an end-to-end esophageal anastomosis.

Occasionally, particularly when there is only esophageal atresia without a fistula, the two esophageal segments are so far apart that the surgeon cannot get them together simply by freeing up the two esophageal segments. In such a situation it becomes necessary to dissect down through the diaphragm to free up a portion of the stomach and to bring the stomach up into the chest to complete the esophageal anastomosis.

(To the patient's mother): Now, Mrs. G., how is he getting along now? How much does he weigh?

MRS. G.: He weighs 28½ lb.

DR. FERGUSON: What can he eat?

MRS. G.: He is on a regular diet.

DR. FERGUSON: He has had to have a few dilatations of his esophagus where it has stenosed. When was the last dilatation performed?

MRS. G.: Last spring.

DR. FERGUSON: I think that you can see that this little boy is really a normal child. He has had a little difficulty postoperatively with esophageal stricture, but he is now taking a normal diet and is of a fairly normal size and weight for his age. He should grow up to be a very useful citizen.

Thanks very much for coming.

Diaphragmatic Hernia

Children with diaphragmatic hernia may have very few or many symptoms and may even be moribund at birth. The child whose x-rays are shown in figure 5 was having moderate symptoms, with cyanosis and some aspiration of feeding. On examination the doctor could not hear breath sounds in the left chest. X-rays showed gas- and fluid-filled loops of intestine in the left chest. To confirm the diagnosis, barium was given by rectum and flowed

FIGURE 5. Roentgenograms of chest of infant with diaphragmatic hernia. The x-ray on the left shows fluid- and gas-filled loops of intestine in the left side of the chest. On the right is the x-ray taken after a barium enema: the intestinal loops have been visualized.

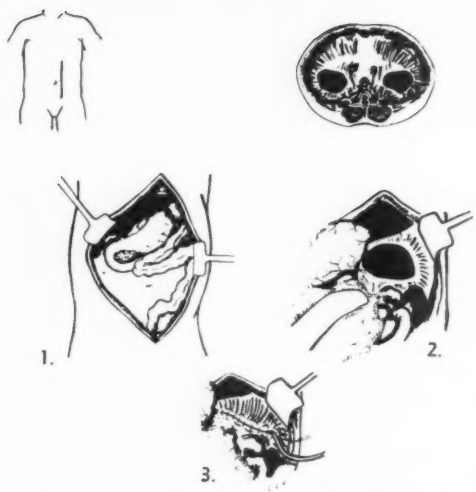

FIGURE 6. Possible sites of congenital diaphragmatic defects. The most common form of congenital diaphragmatic hernia occurs through the left pleuroperitoneal foramen of Bochdalek. The technic for operative reduction of the hernia and closure of the diaphragmatic defect is shown.

up into the descending colon and into the intestine in the chest.

Whether symptoms are mild or severe, these children should be operated on early in the newborn period.

Figure 6 shows the diaphragmatic defects that one may encounter. They may be retrosternal, para-esophageal, para-aortic or right-sided pleuroperitoneal in type, but the common hernia is through the left side of the diaphragm. Usually there is no hernial sac.

The operative treatment of diaphragmatic hernia is also shown in figure 6. An incision is made in the abdomen. On opening the peritoneum the surgeon finds only the stomach, the duodenum and the distal colon in the abdominal cavity. Other viscera, including the spleen, are up in the left chest. The surgeon draws down the hernial contents and eventually ends up with a large defect in the diaphragm. Then it is possible to sew the edges of the diaphragmatic defect closed, to replace the viscera, and to close the abdomen.

The roentgenogram in figure 7 is of the same child whose diaphragmatic hernia is illustrated in figure 5, and was taken about 10 days postoperatively. The heart is in the midline, both lungs are expanded, and both leaves of the diaphragm are normal. Two months postoperatively, the abdominal incision was well healed and the child was doing well.

Chalasia

Another condition which does not constitute a surgical emergency but which I include because it occasionally is confused with a surgical emergency is cardio-esophageal relaxation, or chalasia, so named because it is the reverse of achalasia. These children have no pinchcock diaphragmatic action at their cardia, so that, on lying flat after feeding, their gastric contents regurgitate back up the esophagus and into their mouths. Because of this vomiting, the infants may be considered as having an obstruction requiring surgery.

The treatment of chalasia is nonsurgical and simple. The babies will not regurgitate providing they are kept in the upright position. After each feeding, they are maintained

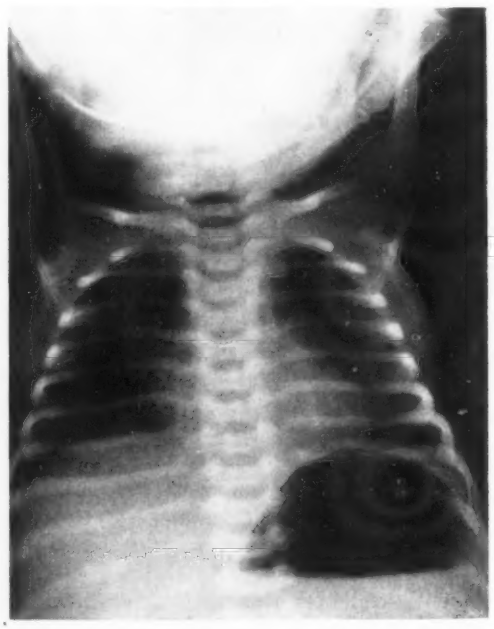

FIGURE 7. Anteroposterior chest roentgenogram taken 10 days following surgical repair of diaphragmatic hernia. Note that the lungs are both well expanded and other mediastinal structures occupy a normal position.

in an upright position for an hour or two. The condition is probably caused by a delay in esophageal development, because at the age of three months almost all these children have gained a normal pinchcock mechanism, without further regurgitation.

Malrotation of the Large Bowel

During a phase of intra-uterine development, the intestines herniate into an omphalocele sac, then return to the abdomen and undergo a process of rotation. Occasionally this rotation process is interrupted and the cecum is situated in the right upper quadrant of the abdomen instead of in the right lower quadrant. Distention of the cecum resulting in a tightening of bands across the duodenum may produce partial duodenal obstruction. These infants intermittently do poorly and well, with frequent vomiting and poor weight gain.

Malrotation can be demonstrated roentgenologically following a barium enema, which shows the malplaced cecum, and following a barium swallow, which reveals a partial obstruction in the duodenum.

The treatment of this condition was first described by Dr. William E. Ladd, and the Ladd procedure is illustrated in figure 8. The malrotated cecum is freed up from its attachments to the right abdominal wall so that it no longer compresses the duodenum. It is placed over in the left side of the abdomen, and after clearing the duodenum of all adhesions the obstruction is completely relieved.

Children with malrotation can get into another type of difficulty which is acute and severe; they may have a volvulus of their entire midgut because of its minimal mesenteric attachments. The clinical picture changes then to one of acute and complete duodenal obstruction. Such a case is pictured in figure 9. This baby had been doing intermittently well and poorly, and then suddenly began to vomit green-stained material. A barium meal showed complete obstruction in the region of the duodenum. A diagnosis of malrotation with midgut volvulus was made and was confirmed by laparotomy.

At operation, the surgeon finds only small bowel presenting, and it is necessary for him to eviscerate the patient before determining the exact situation. He untwists the bowel, and to complete the operation he must do Ladd's procedure and divide the bands that extend across the duodenum to prevent further epi-

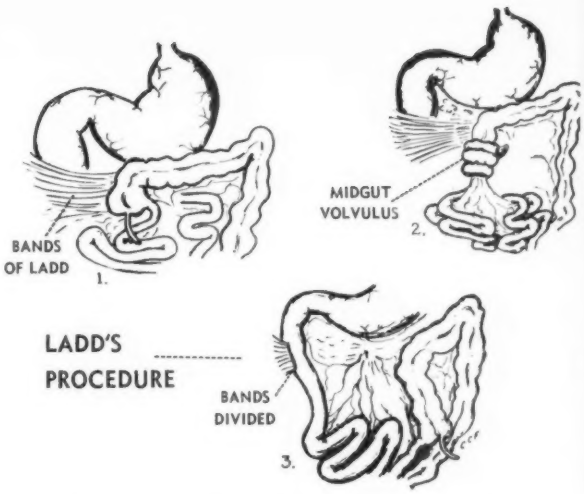

FIGURE 8. Malrotation of bowel with and without midgut volvulus.

1. Diagram showing adhesions extending across duodenum from abnormally situated cecum.
2. Malrotation with midgut volvulus.
3. Drawing showing the position of the viscera following reduction of the volvulus and division of the duodenal adhesions.

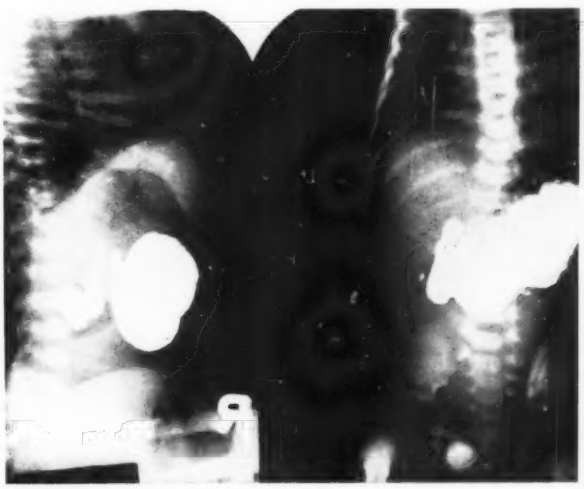

FIGURE 9. Lateral and anteroposterior x-ray views of child with complete duodenal obstruction caused by a malrotation with midgut volvulus.

sodes of intermittent duodenal obstruction. After operation, the duodenum descends entirely on the right side, with the cecum and colon on the left. The appendix lies on the left—a fact about which the parents should be informed.

Duodenal Atresia or Annular Pancreas

Complete obstruction in the region of the duodenum may be due to duodenal atresia or to an annular pancreas. In one such case, the child was perfectly normal at birth, but shortly thereafter began to vomit bile-stained material. An x-ray disclosed a gas bubble in the stomach and duodenum, and no other gas in the entire abdominal cavity. Obviously, this child had complete obstruction in the region of the duodenum.

The treatment for either annular pancreas or duodenal atresia consists of constructing a retrocolic duodenojejunostomy so that the food can go right on down through the intestine (figure 10).

Jejunal Atresia

Lower in the intestinal tract one may encounter jejunal atresia, which also causes neonatal vomiting of bile-stained material. Because the proximal intestine is decompressed by vomiting, there is no or only slight abdominal distention. The blind-ending proximal jejunum is tremendously dilated and thick-walled. The distal bowel is spaghettilike in appearance. It is necessary to perform a side-to-side jejunal anastomosis as illustrated in figure 11.

Ileal Atresia

A child with ileal atresia may have marked abdominal distention, with tremendously dilated loops of bowel. In addition, fairly frequently the intestine has perforated in utero, and x-rays will reveal areas of calcification within the peritoneal cavity. This is a sterile, nonbacterial, chemical type of peritonitis, and usually the perforation has sealed over by the time the child is born. At laparotomy the surgeon does not find meconium in the peritoneal cavity; he finds only calcified plaques and numerous adhesions.

In a case of ileal atresia the surgeon has a choice of operation. He can do an anastomosis, as was shown for jejunal atresia, or, because there is sufficient proximal bowel to maintain the nutrition of the child, he can perform a Mikulicz ileostomy, exteriorizing the blind ends of the proximal and distal intestine (figure 12). The tremendously distended proximal bowel is sewn to the distal bowel, and the two ends are brought out through the abdominal incision. After closing the incision, the surgeon opens the two protruding intestinal segments. The child's immediate obstructive difficulties are over because he can pass

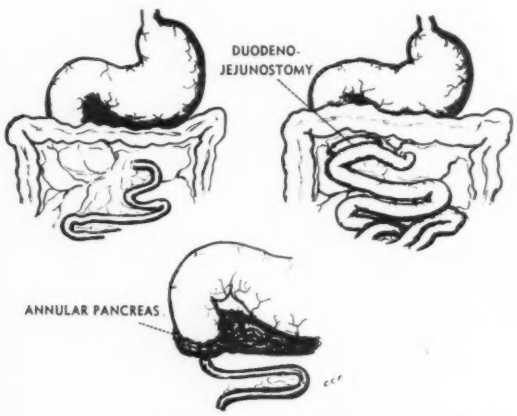

FIGURE 10. Duodenal atresia treated by duodenojejunostomy. An annular pancreas also may cause duodenal obstruction and also should be treated by performing a short-circuiting anastomosis.

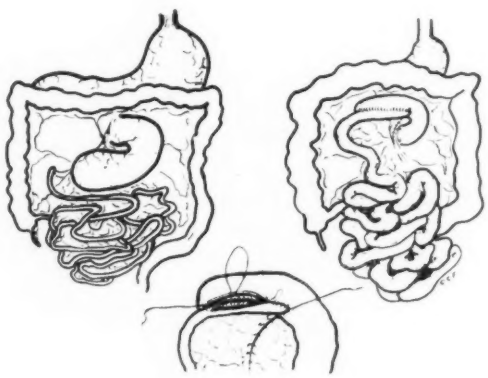

FIGURE 11. Jejunal atresia treated by a side-to-side isoperistaltic jejunal anastomosis.

his fecal contents out the ileostomy. Later, a special crushing clamp is applied to destroy the spur between the two loops, thus re-establishing bowel continuity. It is a comparatively simple second operation to close the ileostomy.

Meconium Ileus

This condition produces intestinal obstruction, but not because of a congenital absence of the bowel or any mechanical defect in the intestine. These children have pancreatic fibrosis or mucoviscidosis. Because they lack pancreatic enzymes, they have exceptionally thick meconium which is puttylike in consistency and which completely plugs the bowel. Roentgenologically, the thick meconium has a characteristic ground-glass appearance (figure 13).

Surgery is required to relieve the obstruction in meconium ileus. The procedure usually consists of constructing an ileostomy at the level of meconium plugging. Later, using solutions containing pancreatic enzymes, the surgeon can irrigate out the thick, sticky meconium to clear the distal intestinal tract (figure 14). After the obstruction has been overcome the ileostomy can be closed, but the child must remain on a diet supplemented by pancreatic enzymes. Because of the high incidence of respiratory infection in these chil-

FIGURE 13. Plain roentgenogram of abdomen showing ground-glass appearance of meconium in intestine, characteristic of meconium ileus.

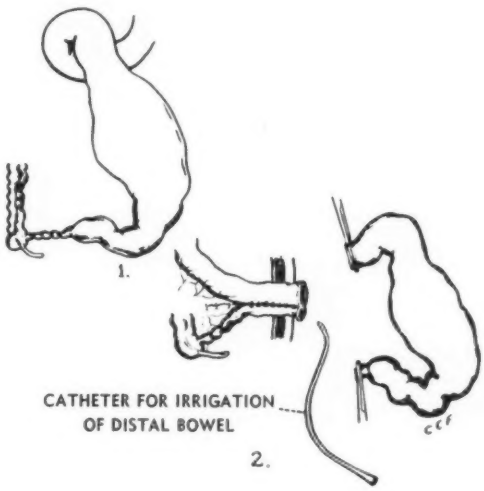

FIGURE 14. Surgical treatment of meconium ileus.

1. Intestinal obstruction produced by meconium ileus.
2. Surgical treatment consists of Mikulicz type of resection of meconium-plugged loop. Irrigations with solutions containing pancreatic enzymes through the distal ileostomy opening will relieve the obstruction in the distal intestine.

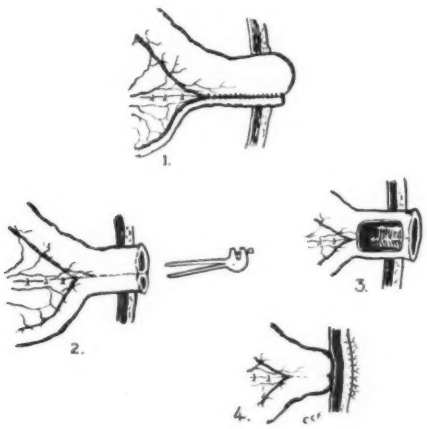

FIGURE 12. Low ileal atresia treated by Mikulicz type of double-barreled ileostomy. After crushing the intestinal spur between the two segments of intestine, the ileostomy is closed.

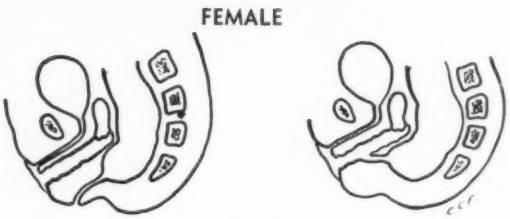

FIGURE 15. Imperforate anus in female. Rectoperineal fistula and rectovaginal fistula.

dren, they should also be maintained on small daily doses of oral TERRAMYCIN.®

Imperforate Anus

Imperforate anus is a fairly common abnormality. The blind-ending rectum may lie very close to the anal dimple, or there may be a considerable gap between the blind-ending rectum and the anal dimple. Occasionally one sees a type in which the external anus is present but there is an atresia higher up in the rectum.

Quite commonly, children born with imperforate anus have fistulas which may extend into the bladder, into the urethra or vagina, or out at the perineum (figures 15 and 16). When there is an external fistula at the perineum or a low fistula in the vagina, or where the gap between the blind-ending rectum and the anal dimple is short, the surgeon can hope to repair the imperforate anus by performing an anoplasty from below (figure 17). If, on the other hand, there is a wide gap between the blind-ending rectum and the skin, and particularly if there is a high fistula into the urinary tract, the surgeon cannot hope to operate from below, but must do an abdominoperineal type of anoplasty (figure 18).

Abdominoperineal anoplasty is performed as follows: The child is positioned on the table with both the abdomen and perineum exposed. A left lower rectus-retracting abdominal incision is employed. In the abdomen, the surgeon frees up the blind-ending rectum and divides the fistula extending into the bladder. The fistula is tied off. Then, making an incision below, the surgeon pulls the rectum down through to the perineum. The blind-ending rectum is opened up and stitches are inserted to create the new anus. The abdominal wound is closed. A suprapubic cystotomy is performed to keep the bladder empty and to guard against leak of urine through the divided fistula. A catheter is inserted in the penile urethra to act as a strut for postoperative healing and to make sure that the surgeon does not injure the posterior urethra during pelvic dissection.

Megacolon

Hirschsprung's disease or aganglionic megacolon sometimes causes troubles in the newborn period. Most patients do not have serious difficulties until they are much older, but occasionally a newborn infant may have episodes of abdominal distention with vomiting, relieved only by the passage of a high rectal tube. Children who have symptoms early in infancy are in for a difficult time, and should have a transverse colostomy performed in the newborn period to tide them over their difficulty. At one or two years of age a resection of the aganglionic rectal segment, as recommended by Dr. Ovar Swenson, is performed.

Sacrococcygeal Teratoma

A certain percentage of teratomas are malignant, and surgical excision should be car-

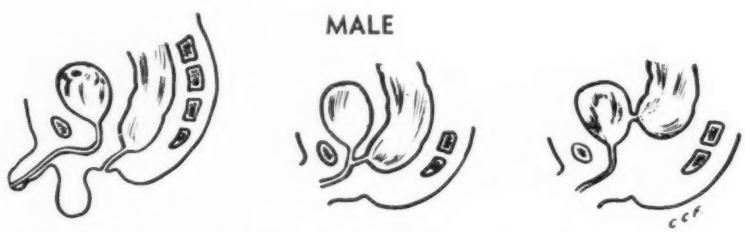

FIGURE 16. Imperforate anus in the male. Rectoperineal, recto-urethral and rectovesical fistulas.

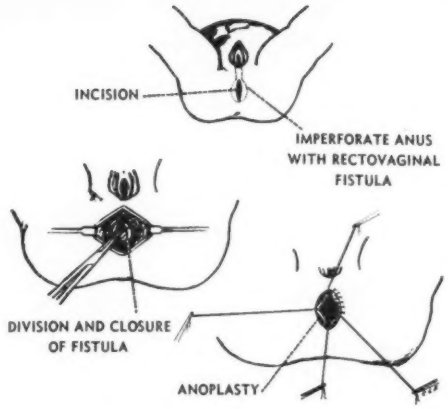

FIGURE 17. Perineal anoplasty.

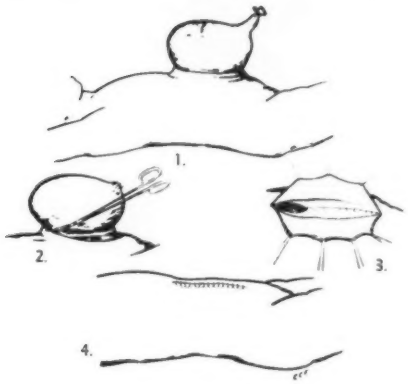

FIGURE 19. Surgical repair of an omphalocele.

ried out very early in life if metastases are to be avoided. At operation to remove a sacrococcygeal teratoma, the child is placed face down, and the incision is made high on the buttocks. The tumor is removed from the rectum. The surgeon reconstructs the skin flaps so that postoperatively the infant will have a normal appearance.

If surgery is done early in infancy, approximately 90 per cent of these children can be followed for five years with a normal course.

Omphalocele

One of the obvious abnormalities occurring in the newborn period is omphalocele. A persistent herniation of the intestine out into the base of the umbilical cord constitutes an immediate surgical emergency, because the cellophanelike covering is subject to early necrosis and ruptures if treatment is not instituted.

Surgical treatment consists of excising the omphalocele sac and pushing the intestine back into the abdomen. The surgeon frees up the various layers of the lateral abdominal walls, and closes the wound meticulously (figure 19).

Occasionally the defect is so large that the surgeon cannot reduce the viscera and effect a layer closure of the abdominal wall. Under these circumstances he can simply close skin over the intestine, producing a large ventral hernia, but at least making a covering that will not rupture. A binder can be applied over the hernia to reduce the intestinal contents back into the abdomen, and then, later, the surgeon can hope that as the child grows, the abdominal cavity will enlarge sufficiently for him to carry out a layer closure.

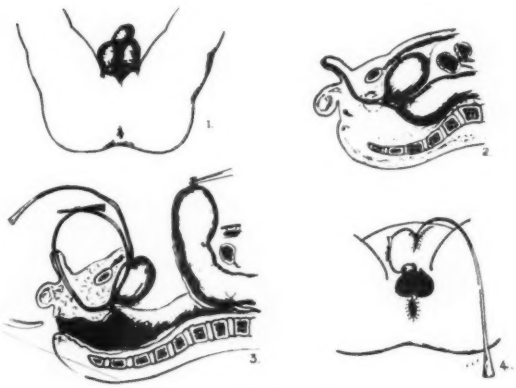

FIGURE 18. Abdominoperineal anoplasty.

Summary

I have attempted to cover a good number of the surgical emergencies that can occur in the newborn period. If these conditions are recognized early in infancy and if the surgeon is given a good chance to treat the child before the onset of severe dehydration, aspiration pneumonia, or other complications, approximately 60 to 90 per cent of these little infants, otherwise doomed to die, can grow up to be normal individuals.

Regional Enteritis

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REGIONAL enteritis occurs fairly infrequently, but we do see it often enough that we should be aware of it as a clinical entity. Furthermore, we should be familiar with the fact that treatment, either medical or surgical, is often ineffective and that the prognosis may be poor. I dislike bringing to you the idea that regional enteritis is difficult to treat, but it is. We know that we must treat patients with the disease in some manner, and in most cases we must utilize surgery, but we must also expect a certain number of failures with any type of treatment of this disease.

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Presented before the thirty-ninth annual Assembly of the Interstate Postgraduate Medical Association at Minneapolis.

Incidence

Dr. Kiefer, one of my associates at the Lahey Clinic, has reviewed the incidence of regional enteritis. His figures, showing an incidence of about 70 per 100,000 admissions, may seem high, but a considerable number of cases of ileitis are referred to the Lahey Clinic. Incidence of the disease is much less in a general practice, yet it is seen occasionally, and should be recognized, because its diagnosis is extremely easy.

The disease ordinarily affects persons of all ages, all races and all social positions, but there is a paucity of cases in the very young and the very old. The greatest number of patients are between 11 and 40 years of age, and in our group of cases 73 per cent have been in this age group. Males are affected in about the same proportion as females. Our report in 1953 covered 223 patients who were operated on, with many having had repeated operations. During 1954, we saw 26 new patients with regional enteritis, and the results were just about the same as for the preceding

223 patients. It must be remembered, however, that a much larger group of patients were treated by medical means. In an occasional case, of course, the disease will subside spontaneously, but it is characteristically a progressive, intermittent process.

Of the 223 patients, most have had resections, and during the past year, we have performed resections on the 26 new patients. The startling fact is that only 109 of the 249 patients had had no previous operation; 140 patients had had a total of over 260 operations, and some of them had had as many as seven or eight. It is amazing that so many of them were operated on repeatedly without the diagnosis having been established or the disease process recognized.

Appendectomies were done in 73 of these patients, and closures of fistulas attempted in 14. Fistulas developed in 18 patients after appendectomy. Resection of the small bowel, ileum and ascending colon was done in only 37 of the 223 patients. In this group also 114 had had 209 operations. Of the 223 patients, the disease process was recognized only in 18 who had had the ileocolostomies and in the group of 37 who had undergone resection. In other words, regional enteritis had been diagnosed definitely in only 55 of the 223 patients in the series.

In his book Crohn has said that he doubts whether any conservative medical treatment is of value in regional enteritis. We feel strongly also that both medical and surgical treatment are inadequate still because of the high incidence of recurrence after any type of treatment. Surgery should be used only for the complications of regional enteritis, but when surgery is employed, we must always keep in mind that it is inadequate and that medical therapy must be utilized after the bowel has been resected or after any type of conservative surgical procedure has been carried out.

I see no logical reason to divide the disease into different types; to me that is only confusing. It must be remembered that ileitis is often seen as an acute process, which may simulate any acute abdominal condition, but more frequently it occurs as a progressively chronic disease. Many patients have symptoms for from two to eight years, and even to as long as 10 years, before they come to surgery. Thus, the observer will see all the manifestations of a progressive disease, including all the different phases from the acute to the more chronic state to the serious complications for which the patient comes to surgery.

Patients who can be treated medically are usually those with localized disease of short duration. Medical treatment is justified in such cases because of the frequency with which spontaneous regression occurs.

A second group of patients can be treated by medical means, because we have no other way to relieve their distress. This group includes those with widespread disease and so much bowel involvement that any type of resection would remove too much of the bowel. Such patients would be thrown into a serious nutritional deficiency state. We have seen this condition occur in a number of patients who have come to us in the past two or three years. The depletion of blood chemical elements is very startling in patients who have had repeated resections. Many of them have hypocalcemia, and many are deficient not only in calcium but also in potassium and sodium.

Diagnosis

One of the problems that has intrigued us is of great importance: how to distinguish true regional enteritis or cicatrizing enteritis or Crohn's disease—whatever you wish to call it—from ulcerative colitis. Drs. Warren and Sommers of the Pathological Laboratory, New England Deaconess Hospital, where most of our pathologic specimens are examined, have stated that regional ileitis and ulcerative colitis are two different pathologic entities, just as different from each other as syphilis and gonorrhea. We have found that the colon and cecum will be involved in about 15 per cent of the patients with regional ileitis. There is spill-over of the ulcerative process into the cecum when the colon is involved. Colon involvement does not exclude regional enteritis, but it does exclude ulcerative colitis. Conversely, we also see involvement of the terminal ileum with ulcerative colitis. About 15 per cent of the patients with regional enteritis have

colon involvement; while with ulcerative colitis, the percentage of patients with involvement of the terminal ileum is much greater—about 34 per cent. Warren and Sommers emphasized that the pathologic picture is entirely different.

The disease process in regional enteritis is a progressive, sclerosing, granulomatous lymphangitis; it is not a systemic disease; there are no other related lesions except perhaps granuloma, which is occasionally seen in the liver. There is marked elephantiasis of the bowel; it is edematous and thick, and the lumen is narrow. The first sign that you may discover in examination of the patient is a mass in the right lower quadrant, since in most of the cases the disease arises in the terminal ileum.

In contrast, the pathologic picture in ulcerative colitis is one of an exudative inflammatory reaction that primarily involves the colon and only the mucosa and submucosa, whereas regional enteritis involves all of the layers of the bowel. But the systemic effects characteristic of ulcerative colitis may be present; you see them in changes in the skin, in the joints and in the liver. You often see patients with progressive ulcerative colitis who are in extremely toxic states, who have jaundice, and who are very ill because of the systemic effects of the disease. Of course, systemic toxic effects are present in any of the ulcerative processes involving the ileum or jejunum and in cases of ulcerative colitis, but they are more marked in ulcerative colitis.

Regional enteritis is an intermittent disease which may be acute, subside and then recur. This intermittent chronic state will continue for many years; that is the history in the majority of the chronic cases.

The symptoms are quite characteristic and should make the physician think of regional enteritis as a possibility. The diagnosis is established easily when a relatively young patient, under 40, has a mass in the right lower quadrant, pain in the abdomen (pain is a very constant feature of the disease), and a low-grade fever and diarrhea, which may be mild. Many of these patients have a secondary anemia, and weight loss is an outstanding feature. These are all systemic effects of a long-standing chronic infection.

Roentgenographic diagnosis is also of great help. Dr. Kiefer has pointed out that the mucosal pattern of the small bowel is obliterated; the bowel becomes narrowed and rigid; the rugae become coarsened, and polypoid changes appear in the bowel. Even though there is a spill-over of the inflammatory process into the colon, the roentgenographic picture is characteristic.

Narrowing of the bowel is a common feature and is a cause of such complications as obstruction and fistula formation. Perforation may occur between the viscera, and fistulas may develop between various loops of the bowel or between the small bowel and the colon. On several occasions we have seen a fistula develop and penetrate into the bladder; such a perforation may produce the first symptom that brings the patient to the physician—the passage of gas while voiding urine.

We also may see many rectal complications which are not uncommon with regional enteritis. If a patient has a fistula or an abscess and a long history of a progressive systemic, toxic process, look for the possibility of regional enteritis.

In figure 1 may be seen the great thickening that occurs in regional enteritis, as well as

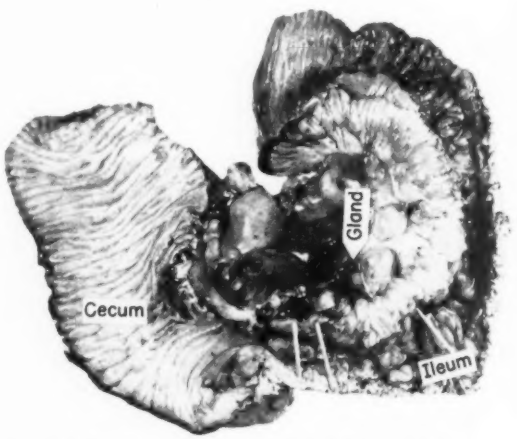

FIGURE 1. Specimen of resected terminal ileum and cecum showing markedly thickened bowel wall, formation of pseudopolyposis, and enlarged nodes in the mesentery.

the marked sclerosing of the mucosa and of all of the layers of the bowel. There is formation of pseudopolyposis and marked thickening of the mucosa, which fades into a relatively normal bowel. This is the characteristic picture.

Figure 2 is a roentgenogram from a typical case of regional enteritis. The small bowel is narrow and obstructed. The communicating fistula may be seen between the obstructed loop and the terminal ileum. By means of this fistulous tract, all of the small intestinal contents are emptied from this loop directly into the cecum. This patient was 19 years old when we saw him and had been in a tuberculosis hospital for about three years with a diagnosis of peritoneal tuberculosis.

The string sign and the obstruction occurring in the loop of the ileum are illustrated in figure 3. In this case there was marked involvement of the colon. The smoothness and rigidity of the bowel can be seen coming right down into the transverse colon. This patient, a 16 year old girl, came to us because of an extensive regional enteritis with marked colon involvement. She also had a fistula from the terminal ileum extending into the bladder, associated with perforation into the peritoneal cavity which caused an abscess.

In this case we first had to drain the abscess, relieve the obstruction, and then do a complete colectomy because of the extension of the process to the colon. We have had seven patients who have had an ileostomy with complete removal of the colon, but the pathologic picture in this extension to the colon is entirely different from that seen in ulcerative colitis.

Regional enteritis may produce skip areas in the intestine, involving scattered segments of the bowel and just one of the higher loops—particularly the jejunum—but as yet I have not seen involvement of the duodenum.

Regional enteritis may be mistaken for neoplasm. This was true in a patient whom I saw in consultation. A diagnosis of inoperable cancer had been made. The jejunum was involved with cicatrizing enteritis just beyond the ligament of Treitz. Resection was performed. Unfortunately, the patient's disease has recurred for the third time. He is nearly 70 years old,

FIGURE 2. Regional ileitis. Terminal ileum shows typical string sign. The dilated ileum proximal to the area shows string sign.

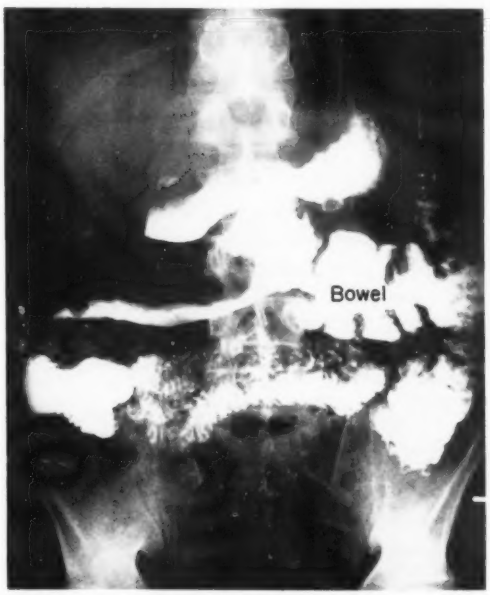

FIGURE 3. Regional ileitis with extensive involvement of ascending and transverse colon.

FIGURE 4. Extension of cicatrizing enteritis proximal to stoma with obstructed dilated ileum proximal to narrowed, affected loop of ileum.

a factor which is very disturbing, as recurrence is rarely seen in older patients.

A complicating feature that we have seen with regional enteritis of this cicatrizing type is the development of abdominal fistulas. These fistulas ordinarily follow removal of the appendix. In many patients who are hospitalized because of right lower quadrant inflammation, appendicitis is diagnosed often, and even in the presence of marked inflammation in the terminal ileum and cecum, appendectomies have been done. We urge that appendectomies not be done in these patients because of the tendency of cutaneous fistulas to develop.

Surgical Methods

Our surgical efforts have been concentrated on resection rather than on conservative operative procedures. There are two surgical methods of treating patients with regional enteritis: (1) conservative procedures, such as an ileostomy or drainage of fistulas and abscesses, and (2) the more radical procedure of extirpation of the focus of infection. We prefer resection, because it not only eliminates the focus of infection and reduces the toxic manifestations of such a profound inflammatory process, but it also prevents many later complications.

Warren and Sommers, in their pathologic studies of regional enteritis, found that the disease has a tendency to progress upward in the small bowel. If an ileocolostomy is performed, the process often will extend beyond the ileocolostomy stoma; the bowel above the new opening into the transverse colon will be involved, and the disease process will recur, with obstruction and very often with more fistulas and more abscesses. Figure 4 shows an ileocolostomy with extension of the process beyond the stomal orifice. This patient had an obstruction of the ileum; the string sign of barium can be seen in the old process that was allowed to remain. The patient had to be operated on again because of obstruction. We prefer to perform a resection in such cases rather than employ a conservative procedure such as ileocolostomy.

In another case, an ileocolostomy had been made between the terminal ileum and transverse colon. Figure 5 shows the unremoved segment of the terminal ileum. The disease had progressed to the point beyond the ileocolostomy so that this was obstructed also, and the patient again had to have a resection.

In the case illustrated by figure 6, the disease had progressed beyond the point of the anastomosis. There was complete obstruction of the loop down into the right colon due to an increase in the inflammatory exudative reaction. Large cicatricial ulcers were present, and this patient was in an extremely critical condition because of the toxic process resulting from the long-retained infection.

The patients who have had ileocolostomies have proved most difficult to treat. We have had 18 such patients; symptoms have recurred in less than one year in three of them, and as late as five years postoperatively in others. These patients are never completely well because they are troubled still by the toxicity which is produced by the retained involved

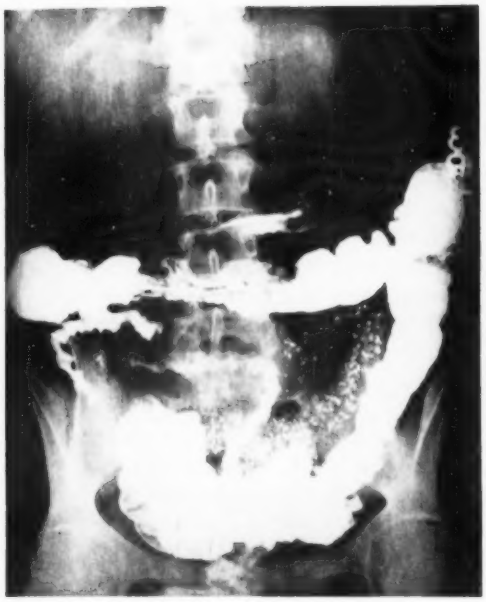

FIGURE 5. Ileocolostomy with involvement of terminal ileum and also of loop of ileum forming the ileocolostomy.

FIGURE 6. Ileocolostomy. Terminal ileum and segment of ileum forming ileocolostomy are narrowed and obstructed

bowel. All of these patients have had to have resections.

We have been criticized for advocating resection for such patients, because other surgeons have stated that the mortality rate of resection is too high. It has been claimed that in a group of cases in which ileocolostomy was done, there were no deaths, while in a similar group, resection resulted in a mortality rate of 14.1 per cent. I agree that the mortality is too high. In our total series of 269 resections there were seven deaths with a mortality rate of 2.6 per cent.

The operation can be done with an anatomic approach which is not difficult. We not only remove the inflammatory process, but also the focus of infection, and thus prevent the complications that would ensue otherwise. We find the mortality rate is not any higher than that associated ultimately with ileocolostomy, and the operation can be done just as easily. Because regional enteritis is a chronic, progressive and intermittent disease, it usually "immunizes" patients having it against any serious infection so that they rarely die of peritonitis. However, if a patient is in poor condition or has an abscess, we do not object to ileocolostomy. (This has been necessary in only five cases.) We prefer to resect the bowel and the colon, if the cecum is involved. Because it is involved in so many cases, we usually remove it and then do a side-to-side ileocolostomy. If the disease process is limited to the small intestine, obviously only that part of the intestine is resected.

Recurrence of the disease is a disturbing feature of regional enteritis, and in the cases reported here, the recurrence rate was 15.7 per cent, as proved by actual operation and removal of the disease process. We believe that the recurrence rate probably would be almost 30 per cent if the figures included those cases in which the diagnoses were made by roentgenographic examinations and from the case histories. In the latter group we have had two cases in which permanent ileostomies were established because of repeated disease recurrence. In one group of cases in which each patient was operated three times, we resorted to permanent ileostomies in three instances.

In seven cases total colectomy with permanent ileostomy was performed, and even then the disease process continued and progressed in the small intestine. One of these cases involved a girl on whom we operated much against our better judgment. She continued to bleed and became exsanguinated. Although she had had pieces of intestine removed, one after another, until only about 6 ft. of the small bowel were left, she was able to live with that small amount of bowel for about two years. She finally died of a massive hemorrhage during a recurrence of the disease.

Usually death is due to inanition, as in the case just described. Other causes of death have been: peritonitis, three patients; embolism, one patient; and cardiac failure, one patient.

Postoperative Care

What can we do to reduce the recurrence rate? We can do little in the way of curative treatment with our present knowledge, but I do want to emphasize the importance of postoperative care. We cannot say to the patient, "You are treated, you are well, you can do what you please." Most of the recurrences in our patients have been within the first two years after operation. Following surgery, we should refer these patients to our medical confreres or take care of them ourselves. This means ordering bed rest; it means dictating a sanatoriumlike regimen for at least six months; it means great attention to their nutrition. We need to give patients medication to reduce intestinal motility, because they often have diarrhea—as many as four to six stools a day—and rectal complications may occur. We must prevent the development of anemia. Most important, we must prescribe a diet that will promote a more normal intestinal function.

ACTH has had no effect on the progress of the disease. It probably improves the patient's nutritional status and feeling of well-being, but it has not proved nearly as beneficial as it has been reported to be in the treatment of ulcerative colitis. Though ACTH may assist in stabilizing the patient's condition when the disease is severe, no change is seen in the bowel during surgery. Following treatment with ACTH, the disease progresses either to local recurrences or to serious complications which require additional surgical procedures, or it becomes a chronic progressive disease with so much bowel involved that very little can be done for the patient.

Antibiotic and sulfonamide therapy has no effect on the inflammatory condition in the bowel. It may have some effect on the secondary bacterial flora, but we have seen no lasting benefits from the long administration of any of these drugs.

In summary, regional enteritis is a discouraging disease, which occurs quite frequently. We must recognize it and realize that it requires a combination of medical and surgical treatment. We must further remember that it requires therapy to prevent recurrences.

Evaluation of Diagnostic Methods in Allergic Conditions of Children

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THE term "allergy," in this discussion, denotes an altered capacity of body tissues to react as a result of an antigen-antibody mechanism. The earlier concept which held that allergens were proteins has been broadened and we now recognize that certain lipids, polysaccharides and inorganic chemicals can, under certain conditions, act as allergens. The antigen-antibody reaction results in pathologic changes in the body tissues, manifested chiefly by smooth muscle spasm, increased capillary permeability, extravasation of fluid into the tissues and increased secretion of the mucous glands. However, nonallergic conditions, particularly acute and chronic infections, can produce the same changes in varying degree, and it is important to distinguish between an allergic state and a clinical condition simulating allergy.

The basic principles of diagnosis of clinical allergic conditions are the same in infants and children as in adults. However, the technic of application and the evaluation of results differ. Allergy is a constitutional disease and a child is not a miniature adult. Proper diagnosis of many allergic states requires an exhaustive study of the child as a whole and not merely of his allergic symptoms. Many major clinical allergic conditions have their onset in early infancy or childhood, making it increasingly important that we recognize them in their early, uncomplicated stage.

Diagnostic Methods

Study of an allergic child must include methods for determining the *specific* etiologic factor. In a general way, these methods consist of (1) history, (2) physical examination, (3) skin tests and (4) special tests. Although occasionally one of these procedures will suffice to make a presumptive diagnosis, more

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frequently a combination of methods is necessary for a specific etiologic diagnosis. For example, it is relatively simple to make a diagnosis of infantile eczema, but to determine the etiologic factor one will need a careful history and possibly skin testing as well as special tests to be discussed later.

History—The history is probably the most important procedure, and when carefully planned and interpreted it will give an etiologic clue in many instances. One cannot complete such a history during the first interview but must continue it for the entire study period. Much valuable information can be obtained on subsequent visits and follow-up study. Form histories do not have as much value as chronologic information obtained after the parent has related the major complaints. Often it is profitable, at the first interview, to allow the parent to talk uninterruptedly, avoiding leading questions but at the same time directing her to an orderly description of the chief complaint. Leading questions depend on the nature of the disease suspected. Of considerable importance is the general impression the examiner gains of the patient as well as of the parent. A visit to the home furnishes information about various sources for possible inhalant allergy and also may prove enlightening in regard to the child's relationship with other members of the family. Little can be gained by questioning the child about his complaints at the initial stage, since most children are fearful and will not cooperate until their confidence has been gained.

Evaluation of information obtained from the history depends to a great extent on the experience and skill of the examiner. He must realize that an allergic child may have major complaints which are unrelated to allergy. Colic in an allergic infant is not necessarily due to allergy. Similarly, a child with bronchial asthma may have gastrointestinal distress and diarrhea based on disorders other than food allergy.

Physicians often place too much weight on the relationship between food dislikes and allergies to those foods. In most cases there is no such correlation, as children may be very fond of foods to which they are allergic, and vice versa. Frequently they dislike foods because the parents insist that they eat them. Also noteworthy is the fact that while a mother's observation that her child has symptoms after eating certain foods should not be ignored, it is best to accept such information cautiously.

A negative family history of allergy does not rule out an allergic basis for a child's symptoms, but a positive family history has considerable significance in suspected cases. The child's past history also is important. A background of repeated, prolonged nose colds (the mother often will state that before her child is over one cold he gets another), frequent bronchitis and episodes of pneumonia suggests an allergic basis for these complaints. There are some pitfalls here which the examiner must avoid. The mother's interpretation of the cold symptoms may be misleading. She may state that every time her child gets a cold an attack of asthma ensues. While such may be the case and the factor of infection in association with asthma is well recognized, the so-called "cold" may be merely the prodromal symptom of respiratory allergy.

Another point which requires evaluation is the statement that the asthma is worse at night, particularly when the child is in bed. This immediately suggests an environmental factor in the bedroom or in the bed itself, but it is equally true that most asthmatic states due to nonenvironmental allergens are worse at night. The reason for this is not clear, but postural as well as physical factors including temperature and humidity changes may play a role.

Particularly significant in regard to the history is the relation of infantile atopic dermatitis to future respiratory allergy. Table 1 represents a study of 60 infants seen in private practice who had atopic dermatitis in early infancy. These patients were examined periodically in their infancy and childhood and later during childhood and adolescence for signs indicating respiratory allergy. Note that 16 or 26 per cent had bronchial asthma before the age of 12 years, and 34 had either pollen hay fever or allergic rhinitis or both by about the same age. Forty or 66 per cent had positive histories of allergy in the immediate fam-

TABLE 1

CLINICAL COURSE OF 60 CASES OF ATOPIC DERMATITIS FROM INFANCY TO ADOLESCENCE (36 MALES, 24 FEMALES)

ALLERGY	AGE OF ONSET (YEARS)															TOTAL CASES	
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*Number*	*Per Cent*
1. Bronchial asthma	3	2	1	3	2	1		2	2							16	26.6
2. Pollen hay fever		1	2	2	2		4	5	1	1	1	1				20	33.0
3. Perennial rhinitis	14 cases before age of 12 years; dates of onset not determined															14	23.0
Gastrointestinal allergy					1		2	1								4	7.0
Chronic eczema	Continuous with remissions and exacerbations; each case combined with 1, 2 or 3															12	20.0
Combination of 1 and 2																4	7.0
Combination of 1 and 3																9	15.0
No allergy																6	10.0

ily. Six patients escaped major allergic manifestations during the period of this study.

Physical examination—A complete physical examination is essential, with special emphasis on the organ system involved in the complaint and including laboratory tests which may be of diagnostic aid. Failure to rule out nonallergic organic disease may lead to costly errors. It is an unfortunate situation when a physician treats an infant on an allergic basis for gastrointestinal or respiratory complaints only to find later that the disease responsible is fibrocystic disease of the pancreas. Similarly, the old adage that "All that wheezes is not asthma" is particularly true in infants and young children. Space will not permit my discussing the differential diagnosis of wheezing. Such conditions as tuberculosis, foreign bodies in the respiratory tract, and congenital anomalies of the respiratory tract and cardia are too well known as possible causes for wheezing to require elucidation. My own impression is that while bronchial asthma may be a cause of wheezing in infants less than one year of age, this diagnosis is made much too often. A much more common cause is infection in the respiratory tract, particularly laryngotracheitis, bronchiolitis or pneumonitis. It is enlightening when one examines these patients in later life and finds no manifestations of asthma or other major allergy. On the other hand, one must also recognize that bronchial asthma has an allergic etiology in infants and children more often than it does in adults. In the latter, only 50 to 60 per cent of cases are due to allergy. Further, fever and infection frequently accompany bronchial asthma in children. Frequent bouts of pneumonia in a child should lead one to suspect respiratory allergy as the basis for the disease. Often such pneumonias are in reality areas of atelectasis secondary to bronchial obstruction caused by plugs of mucus and may be allergic in nature. The wheezing in such cases may be inspiratory as well as expiratory and more pronounced unilaterally.

Examining the nose is an important procedure in infants and children. The typical "allergic nose" is characterized by pale, glistening, edematous and occasionally polypoidlike mucous membranes. Nasal smears may demonstrate a high incidence of eosinophils. Lack of

TABLE 2

SKIN TESTS ON 37 INFANTS WITH ATOPIC DERMATITIS (4 TO 12 MONTHS OF AGE)

TEST SUBSTANCE	SCRATCH TEST POSITIVE	ADDITIONAL INTRADERMAL TEST POSITIVE	TOTAL POSITIVE	
			Number	*Per Cent*
Milk	4	6	10	27
Egg white	16	4	20	54
Wheat	3	5	8	21
Orange	0	3	3	8
House dust	2	4	6	18
Alternaria	0	3	3	8
Whitefish	0	1	1	3

typical findings does not rule out allergy as the underlying cause of nasal symptoms, because superimposed infection often will produce redness of the mucous membranes and a yellowish, thick nasal secretion rather than a thin, watery discharge. Only when the infection has subsided can one demonstrate the typical findings in the allergic nose.

Skin tests—Skin tests are used for demonstrating a specific etiologic agent in allergic disease. Generally speaking, the test result depends on the presence or absence of a skin-sensitizing antibody (reagin) in the host. It is considered a valuable aid to diagnosis if properly interpreted and correlated with the history and clinical course. The physician who fails to realize this and who depends on the skin test alone to solve his problem will invariably make a costly error. Experience has taught us that in many allergic states multiple skin sensitivity is the rule. It is similarly wrong not to utilize the skin test. The physician who makes proper use of all available gainful methods very likely will have more success in his search for causative factors in allergic disease. Sometimes after compiling an exhaustive history one finds that the skin test provides the first clue to the type of sensitivity present and the offending allergen.

The statement is often made that the skin of infants is nonreactive. This is not true. Our recent experiments[1] have convinced us that the skin of infants is capable of demonstrating an antigen-antibody reaction. This reaction may be in the form of erythema or whealing, depending on the concentration of antibody in the tissue and on the potency of the allergen used. Most of the negative skin tests in infants are not due to a faulty mechanism in their skins but to absence of antibodies. Table 2 shows results of skin tests performed on a group of infants with atopic dermatitis.

Skin tests to foods—A positive result of a skin test to a food may indicate past, present or potential sensitization to that food. Such positive results, especially when obtained with the scratch technic, are more likely to indicate clinical sensitization in the infant or young child than they are in the older child or adult. In about 50 per cent of cases of older children, positive skin tests to foods indicate past or nonspecific sensitization and do not provide an etiology for the clinical condition under investigation. Negative results do not necessarily rule out an allergic basis, and other procedures are necessary to prove or disprove their implication. It is interesting to note that such violent allergens as fish and nuts, which frequently cause symptoms, are, according to Leibowitz and associates,[2] far down the list of foods which induce positive skin tests. The same is true of wheat, milk and chocolate. Such foods as lettuce, spinach and tomatoes frequently give positive skin tests, on the other hand, but seldom are responsible for allergic symptoms. Hill[3] has found a correlation between skin tests for foods and respiratory allergy in about 20 per cent of cases

of bronchial asthma in children. It can be stated that a positive skin test to a food has greater significance in infants or young children than in older children or adults. In any case it seems clear that one must evaluate the results of skin tests to foods and correlate them with clinical history and results of elimination diets or intentional feeding.

The proper preparation of food allergens for skin testing often is a difficult process and the allergens used may contain irritants capable of producing nonspecific skin reactions, usually erythematous. Also, we cannot be certain that the food allergens used for testing are the actual allergens which, after ingestion and digestion, cause the clinical symptoms.

Skin testing to inhalants and pollen—Results of skin tests to inhalants generally have greater clinical significance than results of those to foods. Positive reactions to such inhalants as house dust, feathers, cat or dog hair, mohair, kapok, molds and pollen are not uncommon after the first 6 to 12 months of life and occasionally are seen earlier. It is worthwhile to note, however, that house dust and feathers frequently act as skin irritants, and evaluation of skin tests to these agents must be guarded unless immediate whealing occurs.

The greatest correlation between clinical symptoms and skin test results exists in respiratory pollinosis, particularly hay fever. In most instances, when pollen hay fever symptoms are present the skin test is positive. If the scratch test with pollen gives negative results an intradermal test should be done. The correlation between symptoms and test results is greater in pollen hay fever than in pollen asthma. One should remember that young children with early hay fever frequently have mild symptoms and many cases are diagnosed as "summer colds" before the typical clinical picture appears. Similarly, children often have symptoms of asthma rather than of hay fever as a result of exposure to pollen. Pollinosis should always be suspected as a cause of seasonal asthma. Dermal sensitivity may not be fixed in early pollinosis, and it is not uncommon in such cases to obtain a positive skin test with pollen only during the season when the pollen is most prevalent. It may take a few seasons of exposure before dermal sensitivity becomes fixed, and this applies particularly to ragweed. With grass pollen, on the other hand, dermal sensitivity frequently precedes clinical symptoms. Our own practice is not to attempt immunization of such patients with grass pollen. In other words, we do not treat patients who have positive skin tests in the absence of a history of clinical symptoms being caused by those allergens. Another important point is that the degree of skin sensitivity has no direct relation to the degree of clinical symptoms. A child may be successfully immunized for pollen hay fever to the point where he is greatly improved clinically, and yet the reaction to a skin test for pollen may not vary from its original intensity.

Special Diagnostic Methods

Even after a thorough study by the methods already outlined, the etiologic diagnosis still may not be clear. Depending on the particular clinical condition, special methods are available and may be not only helpful but also the only means of arriving at a specific diagnosis.

Indirect skin testing—Prausnitz and Küstner[4] first described the passive transfer method in 1921. It is an attempt to demonstrate the presence of a specific antibody (reagin) in the serum of an allergic individual. This antibody frequently can be transferred to the skin of a nonallergic person and demonstrated by injecting the corresponding antigen into the passive skin site. The resulting antigen-antibody mechanism in the skin will produce an immediate reaction. The test is useful in cases in which direct testing is not feasible, such as generalized dermatitis, chronic urticaria and dermographia, and also when one wishes to check the validity of an unusual number of positive direct skin tests. It may also be of help in cases of skin anergy, which is present in about 3 per cent of children. It is a valuable procedure and frequently can be carried out in the office.

The patch test—This test, although not applicable to atopic hypersensitiveness, is of diagnostic aid in contact dermatitis. A positive patch test produces erythema, edema and

frequently vesiculation at the test site within 72 hours. It has its limitations, as the testing substance may sensitize a previously nonsensitive skin if the test is repeated often. One should be careful not to apply the testing substance too close to the area of dermatitis, as marked aggravation of the existing condition may result. The patient often is concerned by the discoloration or hyperpigmentation of the test site. Generally, however, the patch test is very useful and resorting to it may be rewarding in instances where the history suggests hypersensitiveness to a certain contactant or group of contactants.

Elimination diets—When skin tests with foods give inconclusive results and the history fails to provide a clue to a particular food or group of foods responsible for the symptoms, elimination diets popularized by Rowe[5] may be useful. Briefly, such test diets consist of foods which rarely cause allergic symptoms. After a reasonable period—10 to 14 days—when allergic symptoms disappear, single foods may be added periodically and the patient is observed for the appearance or exaggeration of initial complaints. Thus, in principle this method consists of eliminating foods or groups of foods causing the symptoms. In infants, since their diet is limited, such a method is simple and may involve only the omission of one food at a time. For older children and adults, prepared test diets are available. Many weeks are required to carry out such a plan, and one must be sure, particularly in children, that sufficient proteins, calories, minerals and vitamins are given.

Intentional feeding—This is another method for identifying the offending substance in cases of suspected food allergy, advocated particularly by Rinkel[6] and Randolph.[7] Essentially it consists of omitting a suspected food for several days preceding the test meal, followed by a four hour starvation period. The food is then properly fed and the patient observed for resulting symptoms. This method is useful if results are interpreted properly. If the symptoms of the presenting complaint or symptoms characteristic of allergy are reproduced after such a test feeding, one is justified in concluding a cause-and-effect association—*provided the same results are obtained repeatedly, two or three times.* The difficulty which arises with this method, however, is that often symptoms resulting from the test feeding are not truly allergic and may be explained by causes other than allergy. The following case* illustrates this point:

A 12 year old boy was admitted to Michael Reese Hospital in April 1955 with a tentative diagnosis of genitourinary allergy. For several months prior to admission he had complained of abdominal discomfort, a desire to urinate, and dysuria following the ingestion of tomatoes or tomato juice. The parents insisted that the boy was allergic to tomatoes and tomato products. After a period of observation the child was fed tomato juice on two separate occasions, and in each instance severe abdominal discomfort resulted after about five minutes, accompanied by a desire to urinate and dysuria. The boy was very anxious and highly disturbed about his complaint. There was no family history of allergy, and the boy had not had any previous allergic symptoms. After a few days, a placebo of water artificially colored to resemble tomato juice was fed in the same manner as before. The symptoms of abdominal pain, a desire to urinate and dysuria followed in about five minutes. Further questioning disclosed that just prior to the first episode of "allergy" to tomatoes the boy had eaten a hamburger sandwich with more than one-fourth of a bottle of tomato catchup on it. Because of the resulting abdominal pain, he was told by his parents to avoid tomatoes and tomato products because he was allergic to them.

Environmental control method—In difficult cases this method, which is similar in principle to the food control method, may be used for diagnostic as well as therapeutic purposes. As a diagnostic method it may help to determine the role of environmental allergens. For example, one can evaluate the role of pollen or house dust or other inhalants if a patient is placed in an atmosphere free from those particular inhalants. Likewise, pollen or other inhalant allergens may be introduced for diag-

*Presented through the courtesy of Dr. R. Klein.

nostic purposes. There are isolated instances in which pollinosis is suspected and the skin test is negative when the inhalation of pollen by the patient or the instillation of pollen into the eyes is indicated for reproduction of hay fever symptoms. It is unwise and occasionally dangerous to attempt such inhalation methods for the purpose of reproducing symptoms of bronchial asthma. While occasionally it may be necessary in cases presenting a difficult diagnostic problem to suggest simple environmental changes for diagnostic purposes, it is extremely rare for a radical change or geographical change to be justifiable for such purpose. Furthermore, certain temporary beneficial results noted following environmental change often can be explained on a psychogenic basis.

Leukopenic index—In 1934 Vaughan and Black,[8] after experimentation, suggested that there is a decrease in the number of leukocytes in the peripheral blood within 45 to 90 minutes after a person eats a food to which he is allergic. While this claim is still supported by some, most allergists do not rely on this test for diagnosis. In most instances the degree of leukopenia is not significant enough to have diagnostic value. Loveless and associates[9] found that such degrees of leukopenia may also be present in the blood of nonallergic persons.

Summary

Diagnostic methods in allergic states of children are discussed and evaluated. While the principles involved are identical in children and in adults, there are differences in the technic of application and in the interpretation of results. One must study the whole child and not merely his symptoms.

A single diagnostic method may be sufficient to provide a specific etiologic diagnosis, but in most allergic states a combination of such methods is necessary. A thorough history can be the most important diagnostic tool. Such a history is seldom complete on the first interview; it must continue throughout the entire study period.

Pitfalls in evaluating the results of the diagnostic methods employed are discussed. The physician who depends on skin tests alone for diagnosis will in most cases make costly errors.

Special tests such as indirect skin testing, patch testing, elimination diets, intentional feeding and environmental study methods are evaluated.

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Scientific Exhibit

Office Management of Ocular Injuries

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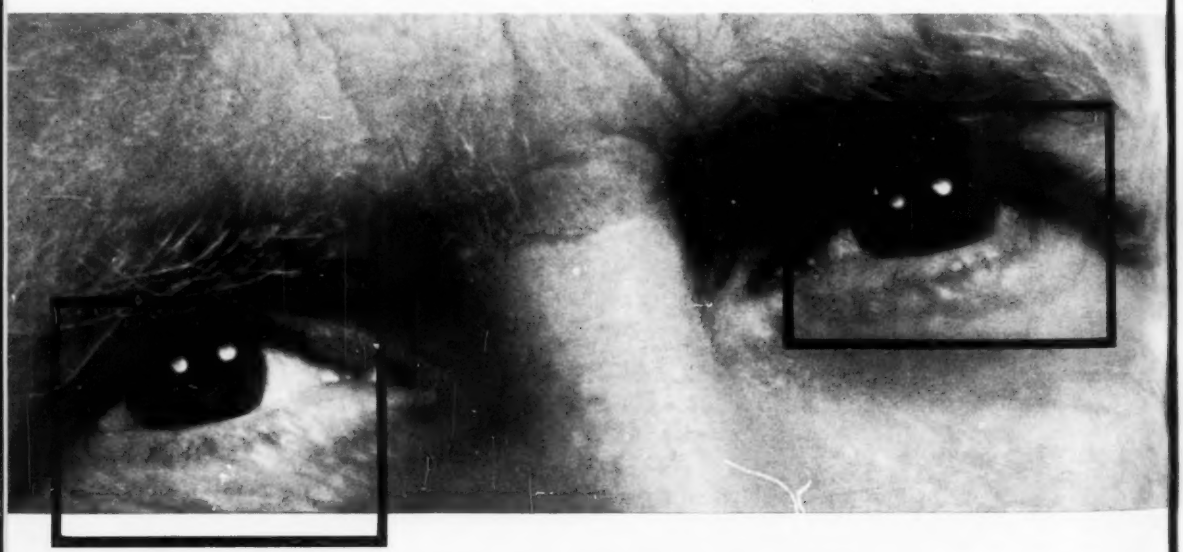
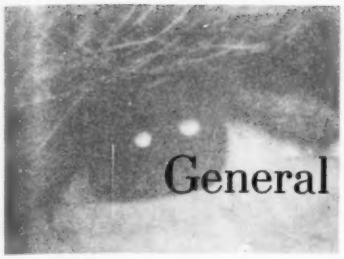


Adapted from an exhibit shown at the 102nd Annual Meeting of the Minnesota State Medical Association, Minneapolis, Minnesota. This exhibit received an award for the best scientific presentation at the 1955 meeting of the Minnesota State Medical Association.



General Management

1. Initial Management

Preliminary history
Gentle cleansing
Check visual acuity
Liquid anesthetic
Use head support
Good illumination
Adequate magnification
Use ophthalmoscope
Examine *both* eyes
Evaluate disability
Institute treatment

2. Evaluating Disability

Every eye injury is potentially serious

- Superficial or penetrating?
- Vision of eye at stake?
- Prognosis of later complications?

Crossroads

- Treat patient yourself
- Send patient to ophthalmologist

3. 20/20 Vision is Compatible with

Cataract
Glaucoma
Strabismus
Brain tumor
Tuberculosis and lues of the eye
Perforating wound
Ocular tumor
Retinal separation

4. Treatment Box Contents

- Cotton balls
- Toothpicks
- Sterile irrigation fluid
- Liquid anesthetic
- Spud and loupe
- Fluorescein stain
- Fine forceps
- Glass rod
- Lid retractors
- Antibiotic ointment
- Cycloplegic ointment (if ciliary congestion)
- Eye pads
- SCOTCH® tape
- Elastoplast
- Skin cleaner solvent

5. Sudden Loss of Vision

- Occlusion, central retinal artery
- Thrombosis, central retinal vein
- Massive vitreous hemorrhage
- Retinal separation
- Acute glaucoma
  - Progressive cataract
  - Chronic glaucoma
  - Retinal separation
- Optic neuritis
- Hysterical blindness
- Concussion retinopathy
- Apparent acute loss:
  - Optic atrophy
  - Intra-ocular neoplasm
  - Amblyopia ex anopsia

Common Eye Injuries

1. The Ocular Foreign Body

- Absent or simulated foreign body
- Wind-borne
- Abrasion
- Contusion
- Flying splinter
- Microscopic organism

2. The Burned Eye

Thermal

Boiling water
Flames
Hot fat
Molten metal

Chemical

Solid
Liquid
Gas

Radiation

Superficial
Retinal

3. Lacerations, Perforations and Penetrations . . .

Handle tissues gently
Examine *both* eyes
No probing
No eye ointments
No atropine medications
Bandage *both* eyes
Prophylaxis against tetanus
Parenteral antibiotic
Systemic sedative
Magnet never diagnostic
Save metal samples
Débridement not necessary
Delayed treatment poor

4. Most Serious Complications

Sympathetic ophthalmia
Recurrent hemorrhage
Intra-ocular infection
Secondary glaucoma
Traumatic cataract
Retinal separation
Muscle imbalance
Corneal opacities
Compression fracture
Malposition and asymmetry

5. Complete Your Records

Vision and version?
Treatment accomplished?
Injury at home or at work?
Goggles and tools used?
Compensation-minded?
Consultation sought?
Past vision record?
Accident prone?
Anaphylaxis history?
Patient's stability?
Pertinent family data?
Follow-up advice?

Tips on Diagnosis and Management

1. The Evaluation Process

Reverse charts with a mirror on opposite wall in an 11 foot room will encourage vision-taking for complete record.

Beware of the pitfalls of too evident diagnosis. The most prominent symptoms may divert attention from more important signs of disease.

Err on the side of undertreatment rather than too much medication. The lysozym in tears makes the best antiseptic eyewash.

A good loupe, a pocket flashlight, an eye spud and a bottle of PONTOCAINE® with a little cotton take up very little space in a treatment bag.

Solutions made with ZEPHIRAN®, except fluorescein, are not culture media.

Specify that 0.5 per cent Pontocaine be made up in 1:5000 Zephiran solution to avoid growth of contaminants.

An argon light costing less than $2.00 helps show abraded areas by making fluorescein stand out.

A +13 diopter hand lens held about 1 in. from the eye will focus light on the anterior segment.

As soon as you know, tell parents that "This child will not be blind."

In many cases the initial history of an eye injury is more valid than a later "compensation-minded" version of the same event.

You need not be apologetic to anxious parents for absence of specialized examination equipment.

2. Foreign Bodies

Atropine causes annoying symptoms long after a foreign body has been removed. Do not use it routinely.

Look for a hidden foreign body under the little "shelf" on the inner surface of upper lid, 1 to 2 mm. from the margin.

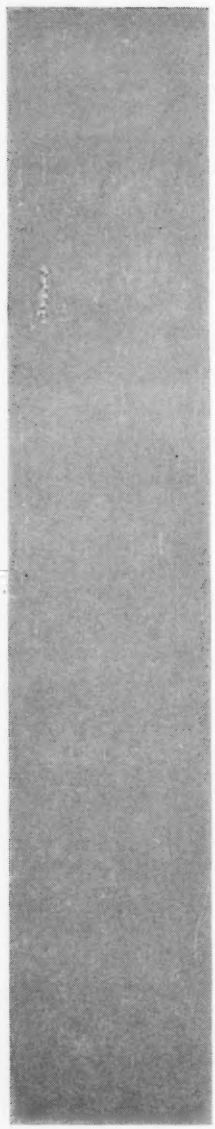
A 1 oz. bottle of fluorescein should last a busy practitioner almost a lifetime. Use matchstick technic of a fraction of a drop and irrigation will be unnecessary.

Treatment of a contused eye with hyphema should be directed to prevent secondary glaucoma and to prevent secondary hemorrhage which occurs from one to six days later.

The puncta lacrimalia can form a perfect scabbard for the swordlike, colorless eyelash, giving marked symptoms of a foreign body that cannot be found.

A hypodermic needle and syringe make an excellent sterile spud and handle for removing foreign bodies.

A foreign body that does not look clear or remove easily? Think of an iris freckle or a keratic precipitate on the posterior endothelium of the cornea.



NEMBUTAL® by rectum, sugar-tits, blanket mummying, plus topical Pontocaine in children help you to remove the offending foreign body. *Tip:* Allow child to straddle your lap so that the nurse can steady the head as you lean over the patient to examine his eyes.

A toothpick moistened with 2 per cent silver nitrate applied to remaining rust ring will facilitate its removal after occlusion for 24 hours.

Aspirin with codeine, 0.5 gr., for a patient who has had a corneal abrasion patched will prevent most 3 A.M. calls.

Do not be talked out of an eye patch after a corneal abrasion.

In blunt contusions in patients with "normal" vision and normal anterior segment, rule out posterior choroidal rents and nonmacular retinal separations with your ophthalmoscope.

An eye that remains irritable after each dressing following corneal foreign body removal suggests "recurrent corneal erosion." This indicates new epithelium loosely attached to Bowman's membrane. Complete corneal cauterization may be necessary.

A tremulous iris or one that jiggles on movement of the eye indicates absence of the lens or a dislocated lens.

Bacillus pyocyaneus is the most vicious of eye bacteria. It forms a grayish exudate. Consultation is needed if this short gram-negative organism is found.

Pontocaine in an uninjured eye also tends to eliminate blepharospasm. If the tip of a hairpin is bent in a J shape it provides a good lid everter.

If blood is seen in the anterior chamber following contusion, order absolute bed rest with both eyes bandaged.

3. Burns

The most important rule for treating all accidents of the eyes involving chemicals is to flush with water immediately.

Alkaline burns of the eye are much more devastating than acid burns. The patient with a chemical burn should hold his lids apart under a water tap or duck his head in a bucket of water while blinking. A salt and soda mixture, one-half teaspoon to a pint of water, is excellent for alkaline burns.

Acid burns of the eye are essentially nonprogressive.

Remove foreign material early in cases of burn and injury to the eyes. Delay may result in intense swelling of lids and prevent adequate inspection and treatment later.

Actinic conjunctivitis from sun lamps, snow-brightness exposure, or altitude glare gives symptoms of a foreign body in the eye from 6 to 10 hours later.

Cataract changes resulting from exposure to ultraviolet rays are thought to be almost unknown.

Cataracts caused by infrared rays are rare and come from prolonged exposure, as in patients who are glass blowers.

4. Lacerations

If in doubt about the magnitude of seemingly severe eye injuries, bandage both eyes while waiting for consultation.

If the cornea is lacerated, do not use ointments.

Do not excise a dangling row of lash follicles or a conjunctival membrane. These "take" with amazing rapidity.

Extensive débridement used in general surgery is not applicable to lid lacerations; the blood supply is too good.

Two main lid anatomic entities are skin-orbicularis and tarsal conjunctiva. In lid repair each should be approximated carefully. In lid lacerations suture layer by layer.

5. Penetrations

Simple lid lacerations can mask a severe globular penetration. If foreign body has penetrated partially into postcorneal surface use pilocarpine to constrict pupil before attempting removal to protect lens.

Small shotgun pellets are now rarely made of lead but of chilled steel and can often be removed with a magnet.

Atropine can promote secondary intra-ocular bleeding and iris prolapse complications and can encourage anterior synechia.

6. Perforations

Patients with flying-splinter eye injuries should bring samples of metal used at time of injury for testing with magnet.

Stainless steel is not magnetic unless it has been machined, rolled or roughly handled by chipping or pounding.

A fast-moving particle penetrating the eye from a grinding wheel need not cause discomfort.

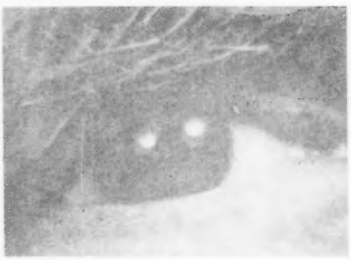
Progressive loss of vision after minor eye irritations in a farmer who does his own plowshare chipping? Think of intralenticular foreign body with resultant progressive cataract.

Farmers doing their own tractor repairing and plowshare chipping who are unaware of the importance of wearing goggles are good candidates for "silent" intra-ocular foreign-body injuries.

A prolapsed iris looks like a blood clot. Leave it alone!

The use of the magnet as a diagnostic instrument to determine whether or not ferrous metal is in the globe is to be deplored. Localize first!

7. Complications



Every patient with an intra-ocular injury should have 1:500 units of tetanus antitoxin, not so much for its specific action as for its foreign protein to produce antibodies and bodily reaction to invasion.

Persistent pupillary fixation, whether dilated or contracted, carries a poor prognosis.

If papilledema, or choke, is present a week or 10 days after shocking injury, think of subdural hematoma.

Three-fourths of all skull fractures will involve eye changes such as peri-orbital ecchymosis, pupillary phenomena, vision loss, muscle imbalance and ophthalmoscopic changes in disk and fundus.

Slipping on ice with a tailbone bump or knocking the head against a barn stanchion are examples of accidents which have caused retinal separation. Markedly near-sighted patients are more subject to retinal separation.

A swollen face can mask an orbital rim fracture which if untreated leads to rectus inferior muscle imbalance and facial asymmetry.

Sympathetic ophthalmia is a serious condition but it does not demand immediate enucleation. Make up your mind in the 10 day grace period. Inability of the eye to look laterally suggests involvement of the most common cranial nerve (sixth or abducens).

Any injury which results in increased intracranial pressure can easily damage optic nerves.

A study of many cases of face and head injuries showed only 12 per cent also involved injured eyes. This is proof of the remarkable protective mechanism which nature provides for the eye.

Double vision every time the nose is blown indicates air pressure is getting through a fracture of the lamina papyracea from the nares to the periorbita.

Eye bandages are worse than worthless unless firm enough to prevent winking.

8. Miscellaneous

Be honest with a child.

If there is extensive bodily injury, first combat shock and do emergency surgery, but examine eyes rapidly, too, if only to cover them both for later definitive care.

If atropine is used tell patients that pupil will be dilated and near vision will be impaired.

No late ophthalmic plastic surgery, no matter how expert, can equal immediate optimum therapy.

If injury is serious the best treatment is to keep the condition *in status quo* until the patient can be transported.

Never enucleate an eye without seeking a consultation. Codeine, 0.5 gr., or DEMEROL®, 50 to 100 mg., will control most eye pain.

The Treatment of Cardiac Arrest

JULIAN JOHNSON*

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A SUDDEN, unexpected death from cardiac arrest in the operating room is a catastrophe to the surgeon, anesthetist and family of the patient alike. Unfortunately it is not a rare occurrence. It may be encountered several times a year on an active surgical service. It is particularly unfortunate when the patient is young and otherwise would have survived. There has been increasing interest in this emergency during recent years, and there is now ample evidence that prompt recognition and intelligent treatment may be rewarded by full recovery of the patient.

JULIAN JOHNSON

Success in cardiac resuscitation depends on many things but prompt action is the most important single factor. If the brain is deprived of its blood flow for more than a few minutes, irreparable damage will result. Thus cardiac arrest must be regarded as one of the greatest emergencies which a surgeon ever faces, since not more than four minutes must elapse between the cessation of blood flow and the institution of artificial respiration and circulation. A few minutes delay may mean the difference between success and failure.

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Etiology and Prevention

The term cardiac arrest is commonly employed to indicate a sudden cessation of blood flow. This may be due to either cardiac standstill (asystole) or ventricular fibrillation. The type of cardiac arrest to be discussed is that which occurs unexpectedly in the operating room and is related directly to the anesthesia or operation. Deaths because of blood loss or other recognizable surgical factors are not included. In general surgical practice, therefore, the term cardiac arrest as commonly used is, by definition, related to the anesthesia and its administration or to unknown factors. In the

practice of cardiac surgery, the direct trauma to the heart is usually the cause of the arrest.

The factors in anesthetic management which may be related to cardiac arrest are: (1) an overdose of the anesthetic agent, (2) inadequate oxygenation of the patient and (3) the vasovagal reflex. These are factors with which every anesthetist is familiar but against which he must constantly be on guard. Some patients are more susceptible to certain anesthetic agents than others. Moreover, when multiple agents are in use, it may be difficult to judge the proper dose accurately. The proper oxygenation of the patient also has become a much greater problem now that the surgeon operates in the open thorax and now that curare and curarelike drugs are in common use to obtain adequate relaxation in abdominal surgery. The vasovagal reflex probably comes into play most often during intubation and extubation of the patient in whom an endotracheal tube is used.

Diagnosis

The prompt diagnosis of cardiac arrest is perhaps the most important single factor in its management, since not more than about four minutes must elapse between the time the circulation stops and the surgeon starts it again by cardiac compression. The anesthetist must therefore observe the patient constantly if he is to notice an abrupt failure of the circulation the moment it occurs.

When the anesthetist observes that the pulse and blood pressure have suddenly and unexpectedly disappeared, we must assume that cardiac arrest has occurred. When the operation is abdominal, the diagnosis may be confirmed immediately by feeling the heart through the diaphragm or by feeling a large artery. When less exact methods of confirming the diagnosis are employed, fatal delay may result. Time spent looking for a stethoscope if one is not immediately available is time ill-spent, since a heart beating so feebly it does not produce a pulse or blood pressure is not apt to be heard anyway.

If an electrocardiograph happens to be attached to the patient, ventricular fibrillation may be diagnosed the moment it occurs. In the presence of ventricular asystole, a profound change in the electrocardiogram also will occur. But if an electrocardiograph is not already attached to the patient, the delay in taking time to attach it will be fatal for the patient.

It becomes obvious, therefore, that the only reliable rapid method to determine whether or not the patient has cardiac arrest, unless the patient has an electrocardiograph or some similar apparatus attached at the time, is to see or feel the heart or a large artery. I am convinced that the surgeon should take the point of view that opening the thorax to feel the heart is a diagnostic procedure. If the anesthetist suddenly and unexpectedly cannot obtain a pulse or blood pressure, the surgeon must accept his observations and open the chest without losing valuable time attempting to confirm these observations or to make a diagnosis of cardiac arrest by time-consuming and perhaps unreliable diagnostic methods.

It goes without saying that if an anesthetist or surgeon has never thought through what he would do under such a circumstance, it is extremely unlikely that he could act sufficiently quickly to save a life. The surgeon needs only a scalpel. If sterile gloves are immediately available, perhaps he may take time to put them on but not otherwise. Skin antiseptics and sterile drapes are refinements which can be added later. Their absence should not cost the patient his life. It is far better to have a live patient with an infected wound than a dead patient with a sterile one.

Given a scalpel, the surgeon should have his hand on the heart in 10 to 15 seconds. The incision should be made in the fourth or fifth interspace. If there is no bleeding, the diagnosis is confirmed. If there is bleeding, the incision need not be carried into the pleural cavity. To avoid cutting into the heart, the knife should not be plunged through the chest wall with one stroke. Having cut through the skin and muscles, the surgeon makes the final opening in the pleura with the handle of the knife or with a finger to avoid cutting the lung. The interspace may then be opened widely while the left hand protects the lung. The hand may then be pushed between the

ribs and rhythmic compression of the heart started. The cartilages above and below may then be cut to allow more room.

Treatment

In the treatment of cardiac arrest it is not important to differentiate between ventricular asystole and ventricular fibrillation at the outset. The emergency problem is to establish artificial respiration and artificial circulation so that oxygenated blood may go immediately to the brain. If there is cardiac asystole from the vasovagal reflex, as a rule the heart will resume normal activity after a few moments of rhythmic compression. If there is cardiac asystole from an overdose of anesthesia, it is a simple problem to maintain artificial respiration and circulation until the excess anesthetic agent is removed or detoxified. If hypoxia is the problem, the circulation of well-oxygenated blood is all that is required. The important thing is that the circulation must be started before there is irreparable brain damage. If the heart is in ventricular fibrillation, other considerations in treatment are usually required, but they come after the tissues are oxygenated.

Technic of cardiac compression—While the anesthetist provides the artificial respiration, the surgeon must provide artificial circulation by rhythmic compression of the heart.

A small heart may be compressed between the thumb and fingers of one hand. A large heart may be compressed more effectively with less effort by using both hands. The effectiveness of the artificial circulation may be judged by the pulse and the improvement in the color of the patient's skin and tissues. If a good pulse is not palpable at the wrist with each compression of the heart, something is wrong.

There are those who feel that the pericardial sac should be opened routinely to improve the effectiveness of cardiac massage. We do not agree with this. Certainly time should not be taken to open the pericardium initially. It is wise perhaps to dissect into the anterior mediastinum in order to get around the heart more effectively during compression. The pericardium serves to protect the heart from trauma. If the heart does not respond early and the ventricles cannot be felt to be fibrillating through the pericardium, it may be opened to visualize the ventricles directly. Subsequent massage should be done with the flat palms of the hands and not with the finger tips. We have seen not only the auricles but the right ventricle torn by the finger tips. If the heart has been massaged for a long time, even through the pericardium, it is probably wise to leave an opening in the pericardial sac to allow drainage of any blood or fluid which may collect as the result of trauma.

We have been able to show in the laboratory that the cardiac output is increased as the rate of cardiac compression is increased.[1] For practical purposes, however, it is satisfactory to use a rate of about 60 per minute when one operator is available or 80 to 100 per minute with two or more operators.

Blood volume—In laboratory experiments, when the dog's heart felt empty, the cardiac output could be increased significantly by a rapid transfusion of blood or a plasma substitute.[1] In clinical practice, care should be taken not to allow the blood volume to be depleted. This can be recognized when the heart feels empty in spite of a wait of a second or more for it to refill. However, equal care also must be exercised not to overtransfuse such a patient.

Drugs—Drugs appear to have no value in getting the heart to start beating again. Once the heart starts to beat, however, some drugs may be helpful in increasing the forcefulness of the contractions. Epinephrine at times appears to be very effective and calcium chloride also has been of considerable help in some patients. In some cardiac patients we have found also that vasoconstrictors, such as norepinephrine, VASOXYL®, NEO-SYNEPHRINE® and others, are of great value. For a time we used procaine routinely in patients with asystole, hoping to prevent ventricular fibrillation. We no longer do so because of its deleterious effect on the blood pressure and its effect on the heart beat.

Ventricular fibrillation—In most instances ventricular fibrillation occurs as the result of operations directly on the heart. Ventricular

fibrillation should be suspected, however, any time the heart, thought to be in asystole, does not respond after a reasonable period of cardiac compression. When the fibrillary muscular twitchings occur in large segments, the diagnosis may be obvious, but if very small segments are involved, it may be necessary to open the pericardium and visualize the myocardium to recognize it.

In rare instances ventricular fibrillation has reverted to normal rhythm spontaneously or following the use of procaine.[2,3] In most instances electric shock technics as developed by Wiggers[4] and Beck and Mautz[5] must be employed. This method of treatment is based on the observation that the passage of a strong electric current through the heart will cause a simultaneous contraction of all heart muscle fibers. Following this contraction, the heart is in standstill as relaxation follows. The spontaneous beat will then return in regular rhythm after a short period of asystole.

Before defibrillation is attempted, anoxia must be overcome by cardiac massage and ventilation of the lungs with 100 per cent oxygen. The color of the myocardium should be returned to nearly normal. It is seldom profitable to shock a cyanosed heart. The amount of current to be used depends on the size of the heart. When dealing with a child's heart, 110 volts for 0.10 second usually will suffice. The same current may be used initially for an adult heart of normal size. For hearts which are greatly enlarged as the result of heart disease, stronger currents may be necessary. We have recently found in laboratory tests that stronger currents may be used safely if the duration is limited with a timing device.[6] If a single shock is not effective, repeated shocks (serial defibrillation) may be necessary.

In using the electric defibrillator it is important to remember that theoretically it is possible to electrocute the operator, and proper precautions should be taken. The handles to the electrodes should be insulated, but it is probably wise for the operator to wear two pairs of rubber gloves. The isolation transformer now present in all defibrillators is an added protection since the operator must come in contact with both electrodes to receive a lethal shock. Even so, it may be wise to avoid contact with the metal operating table and to stand on a wooden stool while applying the shock. Assistants and anesthetists should take their hands off the patient and operating table as the current is applied.

Clinical Experience

There were approximately 108,000 operations performed at the University of Pennsylvania Hospital during the eight year period from January 1, 1946 to January 1, 1954. There were 12 cases of cardiac arrest in patients undergoing cardiac surgery and 18 instances of cardiac arrest in all of the other operations. This is an incidence of 1:6000 operations when cardiac cases are excluded or 1:3600 when all cases are included. Resuscitation was successful in only one-third of the cardiac cases, while it was successful in one-half of the general cases.

As the experience in this hospital has grown, the concept of opening the thorax quickly in cases of suspected cardiac arrest has been stressed repeatedly to the personnel of the departments of surgery and anesthesiology. As a result, several patients owe their lives to the quick action of resident surgeons who opened the chest on the advice of the anesthetist without waiting for consultation. In almost every instance in which resuscitation was unsuccessful in the general group, the failure could be attributed to delay. Two of our failures in 1953, for example, were in orthopedic patients in body casts. Valuable time was lost in removing enough of the body cast to get at the heart. One of these patients, a child, was a decerebrate specimen on our wards for 14 months before dying.

In the general group of patients (excluding cardiac patients) the heart was usually found in standstill. Almost without exception, the heart either returned to normal rhythm or went into ventricular fibrillation. With few exceptions, the heart could then be defibrillated by electric shock after it was well oxygenated. In the failures, the patients either died later as a result of brain damage or their hearts did not continue to beat effectively. Al-

most without exception, failure could be attributed to too great delay.

In some of the cardiac patients ventricular fibrillation was apparently caused by direct stimulation of the heart. In others the heart gradually slowed until it stopped and then, on cardiac massage, went into fibrillation.

Of the 10 patients who developed ventricular fibrillation during a cardiac operation, all but one could be defibrillated. The others were returned to their beds, but only two survived to leave the hospital. The others died from 2 to 30 days later. In no instance was there any evidence of brain damage because resuscitation was begun without delay.

In this report I have not included attempts at cardiac resuscitation outside of the operating room. Unquestionably the chests of a number of patients have been opened on our wards when the patients have been entitled to die in peace. On the other hand, there can be no doubt that in several instances the patient's life would have been saved except for delay in opening the chest. The delay in diagnosis and treatment is difficult to overcome outside the operating room where the patient may not be observed constantly. We have had no successes under such circumstances. One try was successful for 30 days, but the patient died before leaving the hospital. In that instance a surgical resident happened to be at the bedside when the ventricular fibrillation occurred.

It would seem perfectly obvious that the most effective method of dealing with cardiac arrest is to prevent its occurrence. It is equally obvious that, when it does occur, many patients can be revived by prompt action on the part of the anesthetist and surgeon.

Summary

Success in cardiac resuscitation depends on the restoration of the flow of oxygenated blood to the brain within about four minutes. All other considerations are only of secondary importance.

All surgeons and anesthetists should become familiar with the technic of cardiac resuscitation since the limitations of time do not allow for consultation should the emergency arise.

During an eight year period, 13 patients have been successfully revived at the University of Pennsylvania Hospital following sudden cardiac arrest in the operating room.

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CLINICOPATHOLOGIC CONFERENCE

Report From Veterans Administration Hospital, Hines, Illinois

Report of Case

A 58 year old white man was admitted to the hospital on December 11, 1954, complaining of chills, fever, dyspnea, and drainage from a recent operative wound of the perineum.

His mother died of a "stroke" at the age of 75 years, and his father at age 64 of pulmonary tuberculosis. The patient had typhoid fever, scarlet fever and malaria in childhood and an episode of jaundice at the age of 18 years. He also had "rheumatism" when he was seven years old, with several attacks in later life, the most recent in 1937. He described the latter attack as an episode of tender, swollen joints lasting one week, and said he was advised to remain at bed rest for three weeks.

In 1942 the patient was admitted to this hospital following accidental injury with fracture of the left transverse processes of the second and third lumbar vertebrae. Physical examination at that time gave essentially negative results except for bruises and some abrasions.

His present illness dated back to October 1954, when nocturia and frequency of urination developed. On November 9, perineal prostatectomy was performed at another hospital. About 10 days later, profuse drainage occurred from the area of incision and the patient had a daily elevation of temperature in the afternoon, usually accompanied by a chill. For one week prior to admission, he had not voided through the urethra; all urine had passed via the fistulous tract. He noted that the chills had increased in frequency to three to four times daily.

For several years the patient had experienced occasional mild episodes of transient pain in the precordial area, sometimes occurring at night and apparently not related to effort. The pain did not radiate. He also had been conscious of a forceful heart beat at times in recent years, and for several years had noted occasional edema of the ankles during the evening, subsiding overnight.

Physical examination revealed an obese white man with pallor of the skin and dyspnea (respiratory rate 28). Flatness to percussion over the right base, decreased tactile fremitus and fine crepitant rales in both bases were noted on examination of the chest. The pulse was regular (rate 76) and the blood pressure 106/68. The left heart border was 1 cm. to the left of the midclavicular line. A pericardial friction rub was heard at the original examination but could not be made out during subsequent examinations. A harsh systolic murmur was heard, however, over the apex and base.

The abdomen was essentially normal except

for slight tenderness to palpation in the left lower quadrant. The right inguinal ring was relaxed, but definite herniation was not demonstrated. An inverted "V" incision in the perineum was gaping and draining urine and fecal material. Rectal examination disclosed a 1 cm. opening in the ventral surface of the rectal mucosa 4 cm. from the pectinate line. The prostate could not be made out. Catheterization of the bladder showed a small amount of urine flecked with fecal material.

A summary of the laboratory findings is given in table 1.

An inlying urethral catheter was inserted and closed drainage started. The patient was transferred to the genitourinary service for management of the fistula.

Supportive therapy consisted of whole blood and parenteral fluids, intended to build him up for correction of the urethrorectal fistula. Because of a positive blood culture (*Escherichia coli*), administration of penicillin and streptomycin was started. Throughout his hospital course, the patient ran a septic temperature, fluctuating from 99 to 104° F. Except for a temporary clinical improvement immediately after institution of antibiotic therapy, the course was progressively downhill.

A medical consultant saw the patient on January 5, 1955. He found the heart action irregular, probably fibrillating. Wheezing and moist rales were heard throughout both lung fields. The neck veins were distended and there was 2 plus edema of the ankles. The liver was enlarged three fingerbreadths below the costal margin. The consultant recommended digitalization, MERCUHYDRIN®, low salt diet, and intravenous fluids cautiously if at all. Signs of heart-failure continued, the blood pressure fell gradually, the patient became unresponsive, and on January 8, at 4:40 A.M., he died.

Discussion by Medical Consultant

DR. ERNEST G. MCEWEN: First, the past history states that this patient had typhoid fever, scarlet fever and malaria in childhood and an episode of jaundice at 18 years of age. Possibly the jaundice was associated with some form of cholecystic disease following the typhoid fever. However, because there is no further mention of illness relating to the liver or digestive organs, it is highly probable that it was simply a catarrhal jaundice or infectious hepatitis from which he recovered completely. It might be interesting from the pathologic standpoint to see whether there are any changes in the liver that indicate previous hepatitis.

TABLE 1

LABORATORY FINDINGS

DATE	FINDINGS
12/11/54	Blood culture positive for *Esch. coli*. Chlorides 582. Nonprotein nitrogen 32.6.
12/12/54	Urinalysis: specific gravity 1.006; albumin, negative; few white blood cells, occasional red blood cell, mucus and bacteria. Red blood cell count 2,660,000. Hemoglobin 9.5 gm. White blood cell count 19,600; polymorphonuclear leukocytes 74, bands 19, lymphocytes 4, monocytes 2. Serologic test negative.
12/15/54	Chlorides 565. Calcium 8.3.
12/17/54	Nonprotein nitrogen 25.
12/18/54	Urinalysis: specific gravity 1.008; albumin, trace; 10 white blood cells per high power field, occasional red blood cell, numerous bacteria.
12/22/54	Red blood cell count 2,250,000. Hemoglobin 7 gm. White blood cell count 9500.
12/29/54	Nonprotein nitrogen 29.
1/3/55	Nonprotein nitrogen 80.5. T.P. 5.6. Chlorides 425. Carbon dioxide-combining power 43.
1/6/55	Red blood cell count 4,500,000. Hemoglobin 13.5 gm. White blood cell count 19,800; polymorphonuclear leukocytes 83, lymphocytes 16, monocytes 1. Hematocrit 45. T.P. 6. Chlorides 510. Carbon dioxide-combining power 48.
Chest x-rays	
12/12; 12/16; 12/19 12/19/54	Pulmonary congestion.
Electrocardiogram	Abnormal, ST depressions, compatible with coronary insufficiency.

So also with the malaria. Although this case represents a problem in sepsis, it seems highly improbable that malaria was a contributing factor.

Much more pertinent is the matter of scarlet fever with a history of "rheumatism" at seven years of age and several attacks later on, the last apparently occurring in 1937. I think we can go back to that later in terms of the heart disease which seems to be present in this case.

The portion of the protocol describing the fracture does not seem to have an important bearing on the final illness.

In October 1954, symptoms developed which were considered to indicate prostatism or some disease for which perineal prostatectomy was done. Complications and a draining perineal sinus developed, and at the time of admission to this hospital the patient had a rectovesical fistula, with urine draining through the fistulous tract rather than from the urethra.

A septic pattern developed in the postoperative course, with chills and fever. One will have to speculate as to the cause of that infection—whether it represented the perineal abscess or whether a secondary focus of infection was established somewhere along the line, particularly a subacute bacterial endocarditis.

In the patient's immediate past history, one finds mild, transient episodes of substernal or precordial pain, apparently unrelated to effort, and wonders whether or not these are related to a possible aortic stenosis or angina. Its failure to be associated with effort makes the diagnosis of angina difficult to sustain. Also, apparently it occurred at night. Nocturnal dyspnea with precordial discomfort usually points to mild left ventricular failure and is particularly common in diseases of the aortic valve, whether it be aortic stenosis or insufficiency and whatever etiology. We can put down that item of information in favor of some disease of the aortic valve for consideration later. The intermittent edema of the ankles noted in the evening simply indicates that the patient was not completely compensated during the years preceding his last illness.

In the hospital, the patient appeared pale, and laboratory findings confirmed the presence of rather severe anemia—red blood cell count of 2,660,000 with 9.5 gm. hemoglobin. His elevated white blood cell count also fits in with the presence of sepsis. The degree of anemia makes one think of an active septicemia or active infection of the blood stream.

The finding, on chest examination, of "flatness to percussion over the right base, decreased tactile fremitus and fine crepitant rales in both bases" would be compatible with effusion, congestive failure, septic pneumonitis, multiple embolization of the lungs, or pneumonia. The septic pneumonitis would be very hard to prove or disprove in the face of frank sepsis elsewhere in the body, and I rather lean away from that diagnosis in view of other more probable factors such as a left-sided heart lesion. In order for a septic or an embolic pneumonitis to occur, we would have to postulate an infected focus in the right side of the heart. Bronchopneumonia, definitely a possibility in congestive heart-failure, is the most probable thing. The precordial friction rub, heard once but not made out later, may indicate that there was a certain amount of pericarditis or, later on, effusion in the pericardium, as there probably has been in the pleura.

The most significant physical finding as far as the heart is concerned is the harsh systolic murmur heard over both apex and base. The fact that it was recorded as being harsh would make one think of aortic stenosis. Also, it was heard notably in the base, the history of paroxysmal nocturnal dyspnea suggests aortic disease, and there is an etiologic factor, namely, rheumatic fever, stretching out through most of the patient's life. We wonder whether there could be mitral involvement. Of course, there can be, and differentiation of pure aortic stenosis without mitral disease sometimes is extremely difficult in a patient in failure who has marked congestion of the lungs and is markedly anemic. Because of the harshness of the murmur, I would strongly suspect that we are dealing with an aortic stenosis. Decompensation was not of a significant degree in this case, according to the record. True, the

patient had a certain amount of ankle edema. One may speculate that if he had rheumatic mitral disease severe enough to give some of these findings, he probably would have decompensated with congestive failure at an earlier date. The possibility of late aortic stenosis with calcific changes is a good one. It is usually found in older rheumatics. There may be isolated changes in the aortic valve alone, and this calcific aortic disease is known to be rheumatic in origin, or a rheumatic history can be obtained in at least 50 per cent of the cases. Some of the remainder are undoubtedly rheumatic, although a few of the cases may be arteriosclerotic.

The other findings on physical examination are essentially noncontributory, except the demonstrating of the fistulous connection between the bladder and rectum. The laboratory data confirm the fact of sepsis and the severe secondary anemia, and the most unusual finding, on December 11, of a positive blood culture for *Esch. coli*. This organism is not a common contaminant in the taking of a blood culture. One wonders where the *Esch. coli* came from. Was it simply a contamination of the blood stream from the local abscess, or was there a secondary focus established in the heart which then continued as *Esch. coli* subacute bacterial endocarditis? This organism very rarely does that. I do not know the figures, but it is among the most unusual organisms found in subacute bacterial endocarditis.

The chest films reportedly showed pulmonary congestion. The electrocardiographic tracings were abnormal, with ST deviations compatible with coronary insufficiency. I checked the three available electrocardiograms, the first two of which were made prior to January 5 when I saw the patient, and they were all sinus mechanisms with depressed ST segments in all three standard leads. On January 6 and 7, the electrocardiograms showed a most peculiar rhythm. The first lead was entirely regular and rather rapid and looked, to me at least, as though it could be a supraventricular tachycardia. The second lead was irregular, and at about every fourth ventricular beat there appeared what apparently was a P wave. I am at a loss to interpret that. Possibly there was a complete AV block with a very slow sinus rhythm, giving a P wave about 50 times a minute, and an idioventricular mechanism, dominant as far as the ventricle was concerned. It could have been a bizarre form of fibrillation, except that it just did not look that way. We can speculate as to the cause. Apparently digitalis was not started far enough ahead of this tracing to have been responsible. The patient was admittedly toxic and agonal.

The other question is this: Does that arrhythmia make us think there was some auricular disease as well as the aortic stenosis? I believe in all probability the man was sick enough and toxic enough to have had aberrant rhythm without necessarily having auricular rheumatic valvulitis—mitral stenosis with auricular changes—to account for it.

I believe that covers most of the problems and would like to make the following anatomic diagnosis. I believe this patient died of bronchopneumonia, terminal. I say this partly because a great percentage of patients who come to autopsy die of bronchopneumonia, irrespective of their primary disease. There was passive congestion and pleurisy with effusion. As to the heart, the etiology would be rheumatic fever, subacute bacterial endocarditis with *Esch. coli*. The anatomic diagnosis would be aortic stenosis, possibly calcific aortic stenosis, with vegetations on the aortic valve; cardiac hypertrophy and dilatation. I do not know about the mitral involvement; it would be a guess as to whether or not there was mitral valvulitis. The functional diagnosis would be myocardial insufficiency. There may or may not have been fibrinous pericarditis, but there was pericarditis with effusion. The diagnosis of the perineal disease would be draining sinus with rectovesical fistula, purulent cystitis and probably purulent ascending pyelonephritis.

We can speculate on where else these vegetations would produce their effect. There may be focal septic abscesses or emboli in the spleen, kidneys and brain. The spleen should be slate gray from the old malaria, and perhaps some changes in the liver could be recognized as being related to previous hepatitis.

FIGURE 1. Gross appearance of the aortic valve with recent vegetations on an old rheumatic valvulitis.

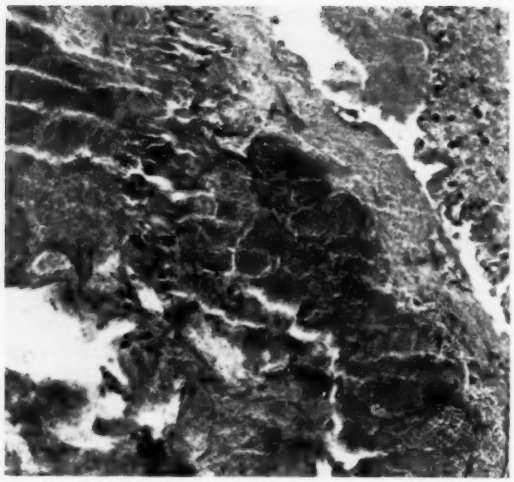

FIGURE 2. Microsection of recent vegetation of the aortic valve.

PATHOLOGIST: I suspect that the medical service knows this case. Someone should give us some other information on that. We cannot make a definite diagnosis on the basis of this history.

Postmortem Examination

Examination disclosed the body of a well-developed, fairly well-nourished 58 year old white man. The body weighed 180 lb. and measured 180 cm. in length. Hair was thin and turning gray. The sclerae were slightly icteric. Skin was dry, wrinkled and rather pale. Superficial lymph nodes were not enlarged. A draining wound in the perineum measured 3 in., with much induration in the area. A small decubitus ulcer was noted at the tip of the coccyx.

Chest examination disclosed a few adhesions to the breast plate and a few filmy adhesions over both lungs. The pericardial sac was enlarged, measuring 19 cm. transversely. On opening the pericardial sac, a large amount of bloody fluid was noted, about 250 cc. The pericardium was red and covered with shaggy exudate.

The heart weighed 620 gm.; the muscle was brownish and friable. There was patchy arteriosclerosis of the coronary ostia. Dissection of the heart showed normal or only slightly dilated pulmonic and tricuspid valves. The mitral valve was fish-mouth in type with healed calcified nodules and fusion of the leaflets, forming a slitlike opening. The chordae tendineae were heavy, thick and shortened. Rheumatic processes had also involved the aortic valve; the leaflets were calcified, nodular and stiff. In addition there was a recent vegetating lesion. The largest of three vegetations was 1.5 cm. in diameter. Just adjacent to a vegetative growth in the myocardium was an abscess 1 cm. in diameter which had not eroded into the endocardium. Almost no evidence of arteriosclerosis of the aorta was found. After opening the heart, it was noted that the chambers were dilated and the heart muscle was rather soft and friable. Microscopic examination showed enlarged muscle fibers with cloudy changes and fragmentation. Examination of the vegetations by means of the Gram stain disclosed nests of small gram-negative organisms which were very similar morphologically to those recovered from the blood culture.

The lungs weighed 2500 gm. combined. Both were brownish and markedly edematous. On cut section there was brown, frothy exu-

date. Microscopically there was very little evidence of pneumonia. The lesion was due mostly to congestion.

The liver was enlarged, weighing 3000 gm., and showed marked toxic change but no abscesses. The spleen weighed 650 gm. and was grayish-red; the pulp was soft. The pancreas and adrenals were normal.

The combined weight of the kidneys was 580 gm. Grossly they were not abnormal. The bladder was contracted, with thickened walls and congested mucosa. The prostate had been removed surgically, and a cutaneous rectourethral fistula was noted. Examination of the gastrointestinal tract gave negative findings. The brain was not examined. The bony skeleton was negative.

Anatomic Diagnosis

1. Bacterial endocarditis of aortic valve with septicemia (*Esch. coli*).
2. Rheumatic heart disease, aortic and mitral.
3. Myocardial abscess.
4. Rectourethral cutaneous fistula.
5. Absence of prostate, surgical.
6. Decubitus ulcer of sacrum.

FIGURE 3. Superior view of the mitral valve showing old calcific rheumatic valvulitis.

Discussion

PATHOLOGIST: Dr. McEwen made the correct diagnosis.

ATTENDING PHYSICIAN: I had not heard of *Esch. coli* endocarditis, so out of curiosity I looked through the "Index Medicus" for the past 10 years. I found no reported case. Dr. Paul White reported that this type of endocarditis accounts for less than 0.1 per cent of the total cases of endocarditis in Boston.

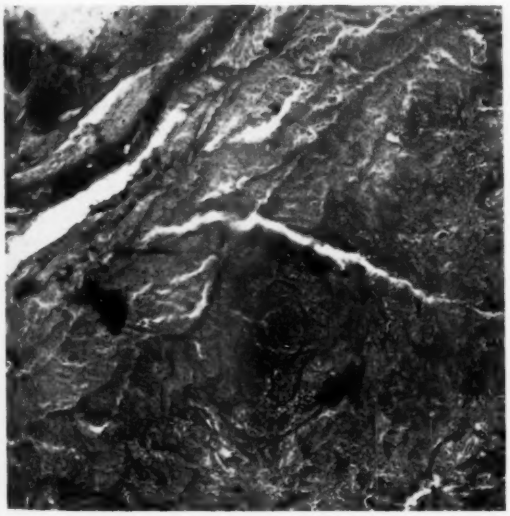

FIGURE 4. Microsection of a scarred mitral valve.

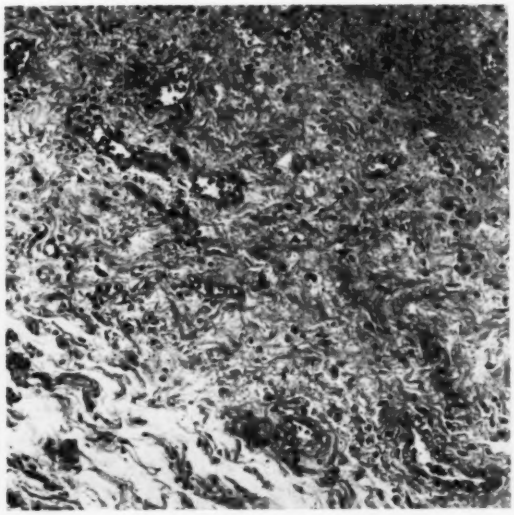

FIGURE 5. Microsection showing pericarditis.

DR. MCEWEN: I read the same page of Paul White. It is only one of the many occasional organisms that are reported as causing endocarditis. I had never seen a case of *Esch. coli* endocarditis before and never expect to see another. I think the interesting feature of this case is that there was subacute bacterial endocarditis rather than a straight contamination of the blood stream from the abscess itself. The fact that favored the diagnosis of an endocarditis was the establishment of adequate drainage of the abscess, in spite of which the severe secondary anemia and sepsis persisted. Ordinarily, with proper drainage plus penicillin and streptomycin, one reasonably might have expected a therapeutic response. It is interesting also that despite penicillin and streptomycin the man accomplished his demise, which is against the law these days.

I do not know how we could have spotted the myocardial abscess, unless serial electrocardiography would show the peculiarities in conduction mechanism if the abscess happened to go in the septum. It has been reported in cases of gumma of the septum. I suppose if one were lucky and very, very shrewd, one might have a guess at that.

As to the pericarditis, again I ask, how did the organism reach there? It must have been via the pericardial arteries, the same as via coronary arteries to the myocardium. I am curious to know whether or not the spleen was slate gray.

RESIDENT: No.

DR. MCEWEN: That was a point made by Dr. Jaffe at the County Hospital. He would always point out a spleen as being a malarial spleen. He never had to prove his point, because there were no histories available.

Residual changes in hepatitis have been reported as very minimal. I think it will be increasingly interesting to collect a group of cases in which there is a history of infectious hepatitis in youth—which presumably occurs in about 5 per cent of the general population—and see whether pathologic changes appear which we can recognize. Only since the war experience with hepatitis has the present amount of interest in catarrhal jaundice been shown. Very few doctors remember to write down that a patient has had measles, but if someone discovered a residual lesion which was recognizable as being caused by measles we would be more complete in that regard. The interest in hepatitis is such that I believe it merits our invariable questioning of the patient in reference to infectious hepatitis, and possibly the accumulation of liver sections. Maybe that type of study will clarify some of our idiopathic cirrhoses.

PATHOLOGIST: We shall report this case. We have never had one here before.

MEETINGS *and Postgraduate Courses*

UNIVERSITY OF COLORADO MEDICAL CENTER, DENVER: General practice review course, January 16-21. Six areas of practice will be the subject of a full day's discussion as follows: Monday—medicine; Tuesday—pediatrics; Wednesday—surgery; Thursday—psychiatry and psychosomatic medicine; Friday—obstetrics and gynecology; Saturday—fluid and electrolyte balance. Registration may be for the full course or part of it. Additional information may be obtained by writing to the Director of Postgraduate Medical Education, University of Colorado Medical Center, 4200 East Ninth Avenue, Denver 20.

UNIVERSITY OF MINNESOTA, MINNEAPOLIS: Continuation course in emergency surgery for general physicians, January 30 to February 1, 1956, at the Center for Continuation Study, directed by Dr. O. H. Wangensteen, Professor and Chairman, Department of Surgery.

UNIVERSITY OF MINNESOTA, MINNEAPOLIS: Continuation course in neurology for general physicians, neurologists and neurosurgeons, February 6-10, 1956, at the Center for Continuation Study, directed by Drs. A. B. Baker, Professor and Director, Division of Neurology, and W. T. Peyton, Professor and Director, Division of Neurosurgery.

Editorials

Postgraduate Medicine

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PREDNISONE AND PREDNISOLONE

THE advertising pages and scientific columns of most medical periodicals are almost overwhelmed these months of 1955 with advertisements for products called scientifically prednisone and prednisolone, which are offered by leading manufacturers under a variety of names. The first of these products were those prepared by Schering under the names METICORTEN®, which is prednisone, also known as metacortandracin, and METICORTELONE®, which is prednisolone, sold also under the name metacortandralone.

The first clinical observations with these products were presented at an interim session of the American Rheumatism Association on November 4, 1954, by Dr. Joseph J. Bunim and his colleagues.[1] By the time their second paper was presented in a symposium before the New York Academy of Sciences in January 1955, the structural formulas of these products had become available. These products are steroids with hormonal properties similar to those of cortisone and hydrocortisone. They are anti-inflammatory, and are three to five times as potent as cortisone and hydrocortisone; most significantly, however, they are devoid of the major undesirable effects of the older corticosteroids.

Pfizer Laboratories presents its product under the name of STERANE®, which is a brand of prednisolone. This product was also known as Deltacortril. The products developed by The Upjohn Company are known as Deltasone and Delta-Cortef. The same products as marketed by Sharp & Dohme, a division of Merck & Co., Inc., are called DELTRA® and HYDELTRA®. The available evidence indicates that all the products are of essentially the same standard quality and are dependable regardless of their market names.

I have studied carefully the various brochures and pamphlets which have been issued relative to these products. Since they are based essentially on the same contributions to the scientific medical literature, they have a remarkable similarity, so much indeed that one company uses exactly the same brochure for both products.

Many studies have been made of the use of these products in rheumatoid arthritis. Their chief advantage over cortisone and hydrocortisone is that they do not cause salt and water retention with ordinary doses. In some instances patients who seem to have ceased to

benefit after prolonged treatment with hydrocortisone and cortisone again develop favorable reactions to the new drugs. The side effects are apparently less frequent with the new products, although adverse reactions, such as digestive complications, vasomotor symptoms and lesions affecting the skin, have been reported. Bunim and his associates found dosages varying from 5 to 25 mg. per day sufficient for satisfactory results. Three patients out of 18 treated for periods up to seven months developed peptic ulcers, and the investigators suggest routine administration of aluminum hydroxide gel with the product to counteract the potential ulcerogenic property.

Forsham and others[2] have found that the excretion of hydrochloric acid is considerably increased in amount during administration of prednisone over that occurring with hydrocortisone.

The newer drugs have been used largely, as might be expected, in the treatment of rheumatoid arthritis. In this condition practically all investigators agree that the superiority of prednisone to cortisone and hydrocortisone as an antirheumatic agent has been clearly demonstrated. The therapeutic effects are enhanced as evidenced by increased functional capacity and reduction of inflammation of the joints. Moreover, these effects are achieved with lower dosages and with less side effects. The time has been too short to say anything with certainty as to the permanence of the effects.

In addition to the use of these drugs in rheumatoid arthritis, they have had extensive trial in intractable bronchial asthma and in several instances have made injections of epinephrine unnecessary. Among other conditions in which the drugs have been tried are nephrosis, disseminated lupus erythematosus, periarteritis nodosa, pemphigus vulgaris, erythema multiforme and various disorders affecting the eye. The reports thus far available indicate that prednisone may be substituted for hydrocortisone in these conditions as a preferable preparation. No doubt, as time elapses, experiences with prednisone in other conditions will be broadened and a more thorough knowledge of its effects on various functions of the body more definitely determined.

In a series of observations made by Ferencz and others[3] on the use of prednisone in acute rheumatic fever with carditis, a prompt decrease in fever, tachycardia, sedimentation rate and joint involvement was reported. Subcutaneous nodules disappeared after 10 days and all cardiac murmurs disappeared in seven out of nine patients. Similarly, the use of prednisone in cases of idiopathic thrombopenic purpura and in leukopenia gave results like those achieved with hydrocortisone, using doses of 40 mg. of prednisone in patients who previously had been treated with 150 mg. of cortisone.

In prescribing prednisone Boland[4] recommends that initial suppression of rheumatoid arthritis should be accomplished in a rather leisurely manner with variations in the dosage according to the severity of the disease or the amount of activity. Dosage reductions to minimum maintenance levels should be gradual. He suggests that maintenance amounts of 5 to 20 mg. given in divided doses are usually sufficient. Amounts greater than 12.5 to 15 mg. almost invariably led to troublesome reactions in women.

The development of these drugs and their availability through a number of excellent sources, at costs which are quite reasonable even for long-continued therapy, constitute a major advance in the care of rheumatoid arthritis and other collagen disorders. The cooperation of agencies concerned with chemistry, pharmacy and clinical investigation has resulted thus in another noteworthy step in medical science.

MORRIS FISHBEIN

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ORAL MUCOSA SMEARS IN CHROMOSOMAL SEX DETECTION

THE nuclei of the epidermic cells of women contain a mass of sex chromatin that is inconspicuous in the nuclei of the skin cells of men. According to Moore and Barr,[1] the nuclei of the epidermis are similar to those of other human tissues in this respect. In cases of hermaphrodism and gonadal dysgenesis, study of these cells is important in defining whether the person concerned leans toward the male or female side. Recently Drs. Moore and Barr have developed a skin biopsy test in which they use smears from the oral mucosa in making this type of study of chromosomal sex. The mucosa of the cheek is rubbed firmly with the edge of a wooden tongue depressor. The material obtained is smeared gently on microscope slides that have been coated with a thin film of Mayer's egg albumin. The slides are immersed immediately in the Papanicolaou fixative (equal parts of 95 per cent ethyl alcohol and ether). The smears are then passed through 70 per cent alcohol, 50 per cent alcohol and distilled water, five minutes in each, with two changes of distilled water, and are then stained with a special staining technic to differentiate the materials studied.

In a test of the method, each of the investigators examined independently 140 smears without reference to the sex of the subjects and was able to diagnose the sex accurately in 100 per cent of the cases. The use of smears from the oral mucosa is obviously a much easier and simpler procedure than the use of sections taken from the skin by biopsy.

MORRIS FISHBEIN

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CHILDREN'S EXOCRINE RESEARCH FOUNDATION

FOUNDATIONS and committees are devoted to many conditions, from infantile paralysis, which has one of the largest and strongest national foundations, through such diseases as epilepsy, paralysis agitans, heart, cancer, muscular dystrophy and multiple sclerosis. Recently POSTGRADUATE MEDICINE* commented on the Playtex Park Research Foundation, which is concerned with investigating biochemical aspects of children's diseases. Among the newest of the organizations is the Children's Exocrine Research Foundation, which is a nonprofit organization to encourage and support research on cystic fibrosis of the pancreas, also known as mucoviscidosis. In mucoviscidosis there is an abnormal flow of mucus from the lungs and pancreas, producing a thick, viscid secretion which obstructs the air passages in the lungs and the ducts of the pancreas so that the child has continual coughs and respiratory infections. At present, treatment includes the use of antibiotics, substitution therapy with material from the pancreas, and control of the cough by the usual methods. Obviously this is wholly symptomatic treatment, and much more needs to be known of the causes of mucoviscidosis so that specific therapy eventually may be developed.

This foundation does not conduct public campaigns nor does it solicit funds from the general public; its money is supplied by grants from other foundations and from selected corporations and individuals. All money raised is used to support research in this still incurable children's disease. The foundation is headed by a board of trustees of which the chairman is Dr. Wynne Sharples of Philadelphia, and a scientific advisory board which includes such distinguished names as Drs. Sidney Farber, Rustin McIntosh and Joseph Stokes. Among the first of its efforts has been the preparation of a pamphlet for physicians which may be secured by writing to the foundation at 2300 Westmoreland Street, Philadelphia. Research workers interested in applying for grants may write to this same address, stating the nature of their projects.

MORRIS FISHBEIN

*FISHBEIN, MORRIS: The Playtex Park Research Institute. Postgrad. Med. 18:469 (November) 1955.

AWARD TO DR. CHARLES W. MAYO

THE physician as a man of letters, in the arts, and in science has been well renowned; many have been as well leaders and statesmen. Such names as those of Clemenceau and Sun Yat-sen have enduring fame.

The American Pharmaceutical Manufacturers' Association has from time to time honored with citations and awards distinguished contributors to the advancement of scientific medicine and medical care. This high honor is bestowed for 1955 on Dr. Charles W. Mayo "for providing a new therapeutic formula to aid international understanding in a politically sick world." Those who knew Drs. William J. and Charles H. Mayo recognized in them the qualities of statesmanship and devotion that are now recognized in the distinguished Editor of POSTGRADUATE MEDICINE, Dr. Charles W. Mayo. In 1953 he was appointed by President Eisenhower a member of the United States Delegation to the General Assembly of the United Nations. His pronouncements drew world attention, particularly his forthright presentation of the issues relating to prisoners of war. Following his service in the United States Delegation, he was elected president of the American Association for the United Nations. In many medical and educational organizations Dr. Mayo holds positions of leadership, including his membership on the Governing Board of the Mayo Clinic, chairman of the National Advisory Group of the Veterans Administration, a member of the National Medical Advisory Board of the American Legion, regent of the University of Minnesota, trustee of the University of Pennsylvania, and many other groups.

The presentation of the award will take place at a formal dinner in the Waldorf-Astoria on December 13 in the presence of representatives of 214 pharmaceutical manufacturers and allied companies which constitute the membership of the American Pharmaceutical Manufacturers' Association. Last year the award was presented to Dr. Vincent du Vigneaud, professor of biochemistry at Cornell University, who was honored this year with the Nobel Prize.

MORRIS FISHBEIN

Index to Volume 18

Subjects

ABDOMEN, wounds, initial treatment, 439; thoracico-abdominal wounds, initial treatment, 440
Abortion, habitual, progesterone treatment, A-24 (Dec.)
Accidents, on stairways, 461; trauma in rural areas, 332
Acromegaly, 21
ACTH and cortisone, ACTH in carbon monoxide poisoning, A-59 (July); effects on rheumatoid arthritis, 64; relation to Addison's disease, 490; treatment of adrenal insufficiency in children, 401; treatment of rheumatoid arthritis, comparison with aspirin, A-58 (Dec.); treatment of skin disease, 218; treatment of spontaneous hypoglycemia, 291
Addison's diseases, 490
Adrenals, *see also* ACTH and cortisone; cortex and relation to disease, 490; insufficiency in children, 401
Alcoholism, therapy, A-52 (Aug.)
Allergy, asthma, bronchial, in infants, 123; asthma, management with ethyl norepinephrine, 397; in children, diagnostic methods, 535
Amputation, complications, phantom limb, surgical relief of pain, 503; traumatic, initial treatment, 437
Analgesia, *see* Pain, relief
Anemia, pernicious (editorial), 149; pernicious, significance of intrinsic factor of Castle, 390
Anesthesia, for traumatized patients, 460; obstetric, as factor in maternal mortality, 4
Ankle, swelling and ulceration, A-24 (Nov.)
Antibiotics, preparation for intestinal surgery, 15; treatment of measles, A-68 (Sept.)
Anticoagulants, incompatibility with mercurial diuretics, A-59 (Aug.)
Anticonvulsants, *see* Epilepsy
Appendicitis, acute, early diagnosis, 175
Arm, *see also* Extremities; lymphedema, prevention, following mastectomy, 277
Arteries, grafting, with Orlon, A-66 (Sept.); sclerotic changes, A-28 (Nov.)
Arthritis, *see also* Joints, disease; rheumatoid, adrenal function and, 497; rheumatoid, comparison of cortisone and aspirin treatment, A-58 (Dec.); rheumatoid, relation to cold (editorial), 152; rheumatoid, treatment with prednisone and prednisolone (editorial), 565
Aspirin, treatment of rheumatoid arthritis, comparison with cortisone, A-58 (Dec.)
Asthma, bronchial, adrenal function and, 497; bronchial, in children, diagnosis, 536; bronchial, in infants, 123; bronchial, management with bronkephrine (ethyl norepinephrine), 397

BILE DUCTS, common duct calculi, 422; common duct obstruction and jaundice, 409, 422
Biological Photographic Association portfolio, 314
Blood, dyscrasias, *see also* Anemia; dyscrasias, erythroblastosis fetalis, 319; dyscrasias, hemolytic disease of newborn, 115; fat in, diagnosis of essential hyperlipemia, 83; hemoglobin abnormalities, significance (editorial), 953; Rh factor, *see* Rh factor; sugar in, *see* Diabetes mellitus; Hypoglycemia; transfusion as cause of infectious hepatitis, 313; transfusion in traumatized patients, 457
Blood pressure, high, 450; high, and congestive heart-failure, A-24 (Sept.); low, control of shock after trauma, 457; low, shock following myocardial infarction, A-24 (Oct.)
Blood vessels, *see also* Arteries; Veins; injuries, initial treatment, 438; peripheral, disease, with swelling and ulceration of ankles, A-24 (Nov.)
Book reviews, Advances in pediatrics (Levine), A-90 (July); Antibiotics annual 1954-1955 (Welch; Marti-Ibanez), A-98 (Aug.); Antimicrobial therapy in medical practice (Flippin; Eisenberg), A-106 (Sept.); Atlas der Haut- und Geschlechtskrankheiten (Frieboes), A-100 (Aug.); Bickham-Callander surgery of

the alimentary tract (Shackelford; Dugan), A-100 (Oct.); Cardiac auscultation (Butterworth; Chassin; McGrath), A-114 (Nov.); Cardiac emergencies and heart failure (Master; Moser; Jaffe), A-100 (Sept.); Cardiology notebook (Fishman), A-106 (Oct.); Cerebral vascular diseases (Wright; Luckey), A-98 (Dec.); Christopher's minor surgery (Ochsner; DeBakey), A-100 (Sept.); Clinical endorcinology (Martin; Hynes), A-102 (Sept.); Clues in the diagnosis and treatment of heart disease (White), A-120 (Nov.); The coagulation of blood: methods of study (Tocantins), A-96 (Aug.); Current therapy 1955 (Conn), A-90 (Aug.); Diagnosis of congenital heart disease (Kjellberg; Mannheimer; Rudhe; Jonsson), A-112 (Nov.); Differential diagnosis of internal disease (Bauer), A-122 (Nov.); Differential diagonsis of leukoplakia, leukokeratosis and cancer in the mouth (Welsh), A-128 (Nov.); Differential diagnosis: the interpretation of clinical evidence (Harvey; Bordley), A-102 (Dec.); Fluoroscopy in diagnostic roentgenology (Deutschberger), A-104 (Sept.); Forceps deliveries (Dennen), A-94 (Aug.); The genesis and prevention of cancer (Handley), A-100 (Dec.); Gynaecology (MacLeod; Read), A-108 (Oct.); Hemorrhage of late pregnancy (Fish), A-102 (Sept.); Hernia; the pathologic anatomy of the more common hernias and their anatomic repair (McVay), A-92 (July); Hysterectomy (Burch; Lavely), A-90 (July); Kinesiology of the human body under normal and pathological conditions (Steindler), A-102 (Oct.); The lung; clinical physiology and pulmonary function tests (Comroe; Forster; Dubois; Briscoe; Carlsen), A-105 (Oct.); Management of disorders of the autonomic nervous system (Palumbo), A-118 (Nov.); Medical and public health laboratory methods (Simmons; Gentzkow), A-102 (Oct.); 1955 medical progress (Fishbein), A-100 (Aug.); The 1954-1955 Year Book of endocrinology (Gordan), A-104 (Sept.); Obstetrics (Greenhill), A-110 (Sept.); Pain: its mechanisms and neurosurgical control (White; Sweet), A-108 (Oct.); Pathology (Herbut), A-92 (July); Pathology for the surgeon (Boyd), A-128 (Nov.); The pharmacological basis of therapeutics (Goodman; Gilman), A-96 (Aug.); Potassium metabolism in health and disease (Holley; Carlson), A-92 (July); Practical obstetric problems (Donald), A-94 (Aug.); Practitioners' conferences (Forkner), A-126 (Nov.); A primer of electrocardiography (Burch; Winsor), A-100 (Oct.); Prolonged and perplexing fevers (Keefer; Leard), A-90 (Aug.); Radiology for medical students (Hodges; Lampe; Holt), A-100 (Dec.); Reactions with drug therapy (Alexander), A-98 (Aug.); A short history of medicine (Ackerknecht), A-108 (Dec.); Surgery of the heart (Bailey), A-110 (Sept.); Survey of clinical pediatrics (Slobody), A-116 (Nov.); Systemic associations and treatment of skin diseases (Wiener), A-114 (Nov.); A textbook of medicine (Cecil; Loeb), A-118 (Nov.); A textbook of neurology (Merritt), A-96 (July); Transplantation of tissues (Peer), A-120 (Nov.)

Brain, injury due to hypoglycemia, 287; temporal lobe lesions and psychomotor epilepsy, 257

Breast, cancer, 510; cancer, recurrence after mastectomy, A-26 (Dec.); excision, radical mastectomy technic, 276; inflammation, management of, 26

Bronchiectasis, 66

Bronkephrine (ethyl norepinephrine) in management of bronchial asthma, 397

Burns, caustic, of esophagus, 159; of eye, 549; severe, treatment with postmortem homografts (editorial), 255; third degree, early excision and grafting, A-70 (Sept.)

CANCER, advanced, management, A-66 (Sept.); noninvasive, carcinoma *in situ*, 374; of breast, 510; of breast, recurrence after mastectomy, A-26 (Dec.); of breast, surgery for, 276; of colon, relation to polyps, 222; of larynx, 215; of lung, diagnosis with x-ray, 361; of ovary, 134; of prostate, 106; of skin, pigmented nevi and, 138; of vulva, 344; relation to trauma, A-34 (Dec.); treatment with carcinolytic drugs, A-30 (Oct.)

Cannabis indica, possible medical use, A-24 (Aug.)

Carbon monoxide poisoning, treatment with ACTH, A-59 (July)

Cervical disk, *see* Spine

Children, *see* Pediatrics

Chlorpromazine, jaundice due to, 349; treatment of mental disorders, 193

Clinicopathologic conference: report from Veterans Administration Hospital, Hines, Illinois, 307, 462, 558

Colon, *see* Intestines

Convulsions, *see* Epilepsy

Coronary thrombosis, *see* Heart disease

Cushing's syndrome, 492

Cytochrome C, in hunger states, A-59 (Aug.)

DERMATOLOGY, *see* Skin disease

Diabetes mellitus, diagnosis, 445; infants of diabetic mothers, management of, 199; maintenance of normal blood sugar, 451; pregnancy and, A-70 (Sept.); trauma and, A-26 (July)

Digitalis, cardiac glycosides and, 40

Diuretics, mercurial, incompatibility with anticoagulants, A-59 (Aug.)

Diverticulitis, *see* Intestines

Duodenum, wounds, initial treatment, 442

EAR, *see also* Menière's disease; surgery, modern technics, 475

Endocarditis, *see* Heart disease

Endocrinology, *see also* ACTH and cortisone; Acromegaly; Adrenals; Ovary; Pituitary; Testes; Thyroid; in office practice, 236

Enteritis, *see* Intestines

Epilepsy, psychomotor, and temporal lobe abnormality, 257; treatment with anticonvulsant drugs, 327

Epinephrine, comparison with ethyl norepinephrine in management of bronchial asthma, 397

Escherichia coli infection as cause of endocarditis, 558

Esophagus, abnormalities in newborn, 519; burns, caustic, 159; hiatus hernia, 294; stenosis, conservative treatment, 6

Extremities, *see also* Amputation; Ankle; Arm; Fractures; Shoulder; Wrist; wounds, surgery, 434

Eye, diseases due to vitamin deficiency, 269; injuries, office management, 542

FIRST AID, occupational medicine and (editorial), 473

Foot, deformity, possible clubfoot, A-26 (Aug.); pain in, diagnosis and treatment, 416

Foreign bodies, in eye, 547

Forensic medicine, arthritis, rheumatoid, relation to cold (editorial), 152; heart disease simulating trauma, A-36 (Sept.); insanity, psychiatric evidence of legal tests of, A-34 (Oct.); medical records and cross-examination, A-34 (July); myocarditis, acute, in sudden death, A-38 (Aug.); poisoning by organic phosphates, A-34 (Nov.); trauma, diabetes mellitus and, A-26 (July); trauma, tumor and, A-34 (Dec.)
Fractures, severe, initial treatment, 436; *see also* Wounds; Wrist

GALLBLADDER, calculi and common duct obstruction, 422; calculi, as cause of jaundice, 409
Gastrointestinal tract, *see also* Esophagus; Intestines; Rectum; Stomach; cancer, noninvasive, 384; infections, laboratory tests in, A-40 (July); problems in traumatized patient, 459
Genitourinary tract, *see also* Urinary tract; wounds, initial treatment, 444
Geriatrics, sheltered workshop in Finsbury, England, A-56
Germany, present conditions in Western Zone, A-56 (Oct.)
"Glandular fever," A-56 (Dec.)
Glycosides, cardiac, indications and use for, 40

HAND, tremor, A-24 (Aug.)
Headache, migraine, shoulder pain and, A-24 (Aug.)
Health services, careers in (editorial), 151
Heart, arrest during surgery, 553; disease, congenital, surgery for, 207; disease, coronary, shock following myocardial infarction, A-24 (Oct.); disease, coronary, treatment, 181; disease, endocarditis due to *Esch. coli*, 558; disease, myocarditis, acute, in sudden death, A-38 (Aug.); disease, myocarditis in newborns caused by Coxsackie virus, A-58 (Dec.); disease simulating trauma, A-36 (Sept.); disease, treatment with cardiac glycosides, 40; failure, congestive, and hypertension, A-24 (Sept.)
Hemoglobin, *see* Blood
Hepatitis, *see* Liver
Heroin, ban on, in England, A-58 (July)
Hoarseness, *see* Larynx
Horder, Lord, obituary, A-56 (Dec.)
Hyperlipemia, *see* Blood, fat in
Hypoglycemia, in infancy and childhood, 287
Hypospadias, 86

ICTERUS, *see* Jaundice
Ileitis, *see* Intestines, disease
Immunization, Salk vaccine (editorial), 81; smallpox vaccination, A-54 (Sept.)
Industrial medicine, first aid, provisions for (editorial), 473; hazards of organic phosphates, A-34 (Nov.)
Infants, *see* Pediatrics
Insanity, *see* Mental disorders
International College of Surgeons, twentieth anniversary, A-58 (Aug.)
Interstate Postgraduate Medical Assembly, program, 358
Intestines, abnormalities in newborn, 523; disease, acute and subacute terminal ileitis, A-70 (Oct.); disease, colonic diverticulitis, 243; disease, polyps in colon as source of bleeding, 222; disease, rectal, in children, 73; disease, regional enteritis, 528; surgery, exclusion operation following exteriorization of small intestine, 230; surgery, preparation of patient for, 15; wounds of colon and rectum, initial treatment, 441; wounds of small intestine, initial treatment, 442
Intrinsic factor of Castle, 390

JAUNDICE, *see also* Liver disease; Rh factor; chlorpromazine-induced, 349; diagnosis, differential, 409
Jenner, Edward, biography, A-54
Joints, disease, diagnosis, punch-biopsy technic in, 47

KIDNEY, calculi, A-24 (Dec.); disease, nephrotic syndrome and adrenal function, 499

LABOR, conduct of, in eclampsia, 165; prolonged, conduct of, 265
Laboratory notes, A-40 (July); A-54 (Sept.); A-50 (Nov.)
Larynx, disease and hoarseness, 212; tumor, lipofibroma, surgical removal, 346
Leg, *see also* Extremities
Leg, stasis ulcers, 233
Liver, disease, as cause of jaundice, 409; disease, serum hepatitis, 307; wounds, initial treatment, 440
Lung, cancer, diagnosis with x-ray, 361; disease, bronchiectasis, 66; wounds, initial treatment, 439

MARIHUANA, *see* Cannabis indica
Mastectomy, *see* Breast
Mastitis, *see* Breast
Mayo, Charles W., Award to (editorial), 567
Measles, complications, prophylaxis with antibiotics, A-68 (Sept.)
Medical research, Josiah Macy, Jr. Foundation, 1930-1955 (editorial), 474; Playtex Park Institute (editorial), 469
Melanoma, *see* Nevi
Menière's disease, treatment, A-24 (Sept.)
Meningitis, pneumococcal, A-59 (July)
Menopause, management, education and sedation in, 95
Menstruation, abnormal, during pregnancy, A-24 (July); irregular, estrogen-progesterone treatment, 236; irregular, hormone treatment, A-24 (Nov.); tonsillectomy during, A-24 (July)
Mental disorders, incidence in United States (editorial), 470; insanity tests, psychiatric evidence in, A-34 (Oct.); "normality," 408; treatment with reserpine and chlorpromazine, 193
8-Methoxysorolen, treatment of vitiligo, A-24 (Dec.)
Migraine, *see* Headache
Moles, *see* Nevi
Mortality, maternal, Minnesota study, 1; (editorial), 80
Mouth, irritation due to galvanism set up by metal prostheses, A-54 (Aug.)
Myocarditis, *see* Heart disease

NAILS, discoloration, in hairdresser, A-31 (Oct.)
Neck, *see also* Spine; wounds, initial treatment, 442
Nephrosis, *see* Kidney
Nerves, surgery for pain relief, 500
Neuralgia, trigeminal, surgical relief, 506
Nevi, pigmented, diagnosis and management, 138
Nutrition, *see also* Vitamins; deficient and eye disease, 269; education in (editorial), 357

OBSTETRICS, *see also* Labor; Pregnancy; mortality study, 1; maternal mortality in Minnesota (editorial), 80

Orlon, for arterial grafts, A-66 (Sept.)
Otology, *see* Ear
Ovary, *see also* Menstruation; tumors, 127

PAIN, relief, 20; relief in traumatized patient, 460; relief, surgical, 500
Pancreas, *see also* Diabetes mellitus; disease, as cause of jaundice, 413; disease, diagnostic clinic, 301; diseases of, benign, 32; tumor and hypoglycemia, 287
Pediatrics, *see also* Asthma; Epilepsy; Heart disease; Measles; Rectum; Tonsils; adrenal insufficiency in children, 401; allergy, evaluation of diagnostic methods, 535; child psychiatry (editorial), 471; hemolytic disease of newborn, 115; hypoglycemia in infancy and childhood, 287; infants, newborn, surgical emergencies in, 519; management of infants of diabetic mothers, 199; research, Playtex Park Institute (editorial), 469
Penis, deformity, hypospadias, 86
Peptic ulcer, treatment, clinical trials (editorial), 470; treatment, surgical, 486; with pyloric stenosis, 468
Pharyngealconjunctival fever, virus studies on, A-50 (Nov.)
Phosphorus, poisoning, hazards of organic phosphates, A-34 (Nov.)
Photography, medical, portfolio from biological photographic association, 314
Pituitary, anterior, tumor as cause of acromegaly, 22; deficiency, A-60 (Aug.); effect on ovary, 236
Playtex Park Research institute (editorial), 469
Poisoning, *see* Carbon monoxide; Phosphorus
Poliomyelitis, Salk vaccine (editorial), 81
Prednisone and prednisolone treatment of rheumatoid arthritis (editorial), 565
Pregnancy, complications, diabetes, A-70 (Sept.); complications, habitual abortion, A-24 (Dec.); complications, preeclampsia and eclampsia, 165; complications, vaginal bleeding, A-24 (July); effect on pigmented nevi, 146
Prostate, cancer, 106
Psoriasis, psychosomatic aspects, A-66 (Nov.)
Psychiatry, children and (editorial), 471; new chemical agents in, 193
Psychosomatic medicine, menopausal symptoms, education and sedation in, 94; research financed by Macy Foundation (editorial), 474; skin disease (editorial), 472; skin disease, psoriasis, A-66 (Nov.)

RACE, classifications, A-24 (Oct.)
Radiation, nuclear, effect on man, A-58 (July)
Records, medical, and cross-examination in court, A-34 (July)
Rectum, *see* Intestines
Reserpine, treatment of mental disorders, 193
Respiratory tract, *see also* Larynx; Lung
Respiratory tract, problems in traumatized patient, 457
Rh factor, erythroblastosis fetalis and, 319; in hemolytic disease of newborn, 115
Roentgen rays, diagnosis of lung cancer, 361; therapy, common sense in (editorial), 354; treatment of cancer recurrent after mastectomy, A-26 (Dec.)

SALK VACCINE (editorial), 81
Shock, *see* Blood pressure, low
Shoulder, pain in, migraine and, A-24 (Aug.)
Skin, cancer, noninvasive, 379; depigmentation, vitiligo, A-24 (Dec.); disease confused with *in situ* carcinoma, 387; disease, psoriasis, A-66 (Nov.); disease, psychiatry and (editorial), 472; treatment with ACTH and cortisone, 218; grafting, *see* burns; test in diagnosis of childhood allergy, 538
Smallpox, vaccination—Edward Jenner, A-54 (Sept.)
Spine, cervical disk and cervical arthritis, 99; disease, surgical relief of pain due to, 500; pain in, A-26 (Sept.)
Sterility, female, hormone treatment, A-24 (Nov.)
Stomach, displacement, esophageal hiatal hernia, 294; secretion, deficient, and intrinsic factor of Castle, 391; ulcer, *see* peptic ulcer; wounds, initial treatment, 442
Surgery, complications, cardiac arrest, 553; emergency, in newborn, 519; future of (editorial), 355; management of traumatized patient, 456; of severe wounds, 430; progress in Switzerland, A-62 (Oct.)
Swiss Society of Internal Medicine, annual meeting, A-60 (Aug.)
Switzerland, surgical progress in, A-62 (Oct.)
Syphilis, early, treatment with penicillin and bismuth-penicillin, A-60 (July)

TESTES, abnormalities, treatment with hormones, 239
Tetanus, immunization in rural areas, 338
Thorax, wounds, initial treatment, 439
Thyroid, abnormalities, treatment, 240
Tonsils, excision during menstruation, A-24 (July); excision in young child, A-30 (Oct.)
Trauma, *see also* Forensic medicine; First aid; Wounds; management of traumatized patient, 456; occupational, in rural areas, 332
Tremor, of hands, A-24 (Aug.)
Tuberculosis, of joints, diagnosis, 53; of larynx, 215
Tumor, relation to trauma, A-34 (Dec.)

ULCERS, *see* Leg; Peptic ulcer
Urethra, inflammation in women, 155
Urinary tract, *see also* Kidney; cancer, noninvasive, 485
Uterus, cancer, cervical, noninvasive, 374

VAGINA, inflammation, estrogen therapy, 238; inflammation, senile vaginitis associated with urethritis, 157
Veins, varicose, obliteration in treatment of stasis ulcers, 232; varicose, treatment, A-56 (Dec.)
Venereal disease, vulval lesions, 340
Vertigo, *see* Menière's disease
Virus disease, *see also* Poliomyelitis; "glandular fever," A-56 (Dec.); laboratory studies of "pharyngealconjunctival fever," A-50 (Nov.); sequelae of Coxsackie infection, A-58 (Dec.)
Vitamins, B_{12}, relation to intrinsic factor of Castle, 390; deficiency and eye disease, 269; B_{12} in pernicious anemia (editorial), 149
Vitiligo, A-24 (Dec.)
Vocal cords, *see* Larynx
Vulva, cancer, noninvasive, 379; diseases, 340

WORLD HEALTH ORGANIZATION, fifth regular session, A-76 (Nov.)
Wounds, *see also* Trauma; of eye, 550; severe, initial management, 430
Wrist, fractures, 187

X-RAYS, *see* Roentgen rays

Index to Volume 18

Authors

Abelson, Neva M., Erythroblastosis fetalis, 319
Artz, Curtis P., Bronwell, Alvin W., Sako, Yoshio, Howard, John M. and Davis, J. Kemp, The initial management of the severely wounded, 430
Atkinson, D. T., Four vitamins in ophthalmology, 269

Beaser, Samuel B., Diagnosis of diabetes, 445
Beck, John C., The adrenal cortex and its relation to disease, 490
Bickel, William H., *see* Polley, Howard F.
Bronwell, Alvin W., *see* Artz, Curtis P.
Brown, Ian A., Psychomotor seizures or temporal lobe epilepsy, 257
Brown, James Barrett, Foreword—special St. Louis issue, 153
Bulbulian, Arthur H., *see* Polley, Howard F.
Burford, T. H., *see* Lawrence, G. H.
Butcher, Harvey R., Jr., *see* Moyer, Carl A.

Chamberlain, Digby, *see* Walters, Waltman
Chute, A. Lawrence, Adrenal insufficiency in children, 401
Clark, R. Lee, Jr., Russell, William O. and Old, Jacob W., Carcinoma *in situ:* A concept of cancer without invasion, 374
Cleveland, David A., Management of cervical disk and cervical arthritis syndromes, 99
Cole, Warren H., Stones in the common duct, 422
Cordonnier, Justin J., Urethritis in the female, 155
Creevy, C. D., Hypospadias, 86

Davis, Ethel M., Bronchial asthma in the infant, 123
Davis, Jeff, Diagnosis and management of pigmented nevi, 138
Davis, J. Kemp, *see* Artz, Curtis P.
Davis, M. Edward, Prolonged labor, 264
Dearing, William H., *see* Griffin, George D. J.
DeGraff, Arthur C., Indications for and use of the cardiac glycosides, 40
Dockerty, Malcolm B., *see* Polley, Howard F.
Dolowitz, David A. and Keyes, Thomas, Lipofibroma of the larynx: Technic for removal, 346
Drew, Arthur L., Anticonvulsant drugs, 327

Eberbach, Carl W., Cancer of the breast, 510
Effler, Donald B., Esophageal hiatal hernia, 294
Evans, Joseph P., The surgical relief of pain, 500

Ferguson, Colin C., Surgical emergencies in the newborn, 519
Flocks, Rubin H., Carcinoma of the prostate, 106
Foland, John Philip, Bronkephrine in the management of bronchial asthma, 397
Friedlander, Harry S., Education and sedation in menopausal therapy, 94

Griffin, George D. J., Judd, Edward S., Jr. and Dearing, William H., Preparation of the patient for intestinal surgery, 15
Guthrie, Donald, Radical mastectomy designed to prevent excessive blood loss and postoperative lymphedema of arm, 276

Hall, William E. B., The industrial hazards of the organic phosphates, A-34 (Nov.)
Hanlon, C. Rollins, Surgery for congenital heart disease, 207
Hartmann, Alexis F., Sr., *see* Pennoyer, Miriam M.
Hawk, Bray O., *see* Keyes, E. Lawrence
Hoerr, Stanley O., Diseases of the pancreas, 32
Howard, John M., *see* Artz, Curtis P.
Hruska, Edward J., *see* Smith, Scott M.

Hullsiek, Harold E., Rectal troubles in children, 73
Hurxthal, Lewis M., Recent developments in endocrinology, 21

Isaacs, John H., *see* Schmitz, Herbert E.

Janes, Robert M., Management of mastitis, 26
Johnson, Julian, The treatment of cardiac arrest, 553
Judd, Edward S., Jr., *see* Griffin, George D. J.

Keyes, E. Lawrence and Hawk, Bray O., Can you ignore aids to earlier diagnosis in acute appendicitis? 175
Keyes, Thomas, *see* Dolowitz, David

Lane, Clinton W., Cortisone, hydrocortisone and corticotropin (ACTH) in dermatology, 218
Lawrence, G. H. and Burford, T. H., Caustic burns of the esophagus, 159
Lempert, Julius, Modern otology, 475
Lewis, F. John, Surgery for peptic ulcer, 486

Marshall, Samuel F., Regional enteritis, 528
Matheson, A., Evaluation of diagnostic methods in allergic conditions of children, 535
McCannel, Malcolm A., Office management of ocular injuries, 542
McComb, Stanley J., *see* Polley, Howard F.
McKelvey, John L., Lessons and problems of a maternal mortality study, 1
McMahon, Alphonse, The treatment of coronary thrombosis, 181
McQuarrie, Irvine, Hypoglycemia in infancy and childhood: Differential diagnosis and therapy, 287
Middleman, I. C., The exclusion operation following exteriorization of the small bowel for gangrenous obstruction, 230
Miles, Victor H., Are your records immunized against cross-examination? A-32 (July)
Moyer, Carl A. and Butcher, Harvey R., Jr., Stasis ulcers, 233

Odell, Richard T., Extension and flexion fractures at the wrist, 187
O'Keefe, Charles D. and O'Keefe, Joseph D., Treatment of preeclampsia and eclampsia, 165
O'Keefe, Joseph D., *see* O'Keefe, Charles D.
Old, Jacob W., *see* Clark, R. Lee, Jr.
Olson, Donald E., Bronchiectasis, 66

Parsons, E. H., New chemical agents in psychiatry, 193
Paulsen, Monrad G., *see* Schiele, Burtrum C.
Pelner, Louis and Waldman, Samuel, Chlorpromazine-induced jaundice, 349
Pennoyer, Miriam M. and Hartmann, Alexis F., Sr., Management of infants born to diabetic mothers, 199
Polley, Howard F., Bickel, William H., Dockerty, Malcolm B., Bulbulian, Arthur H. and McComb, Stanley J., A new punch-biopsy technic for diagnosis of joint diseases, 47
Proetz, Arthur W., Introduction to Biological Photographic Association Portfolio, 314
Puestow, Karver L., Conservative treatment of stenosing diseases of the esophagus, 6

Rezek, Philipp R., Tumor and trauma, A-34 (Dec.)
Rigler, Leo G., X-ray diagnosis of cancer of the lung, 361
Risser, Joseph C., Painful feet, 416
Russell, William O., *see* Clark, R. Lee, Jr.

Sako, Yoshio, *see* Artz, Curtis P.
Sanford, Arthur H., Laboratory notes, A-40 (July); A-54 (Sept.); A-50 (Nov.)
Saphir, Otto, Acute myocarditis in sudden and unexpected death, A-38 (Aug.)
Schiele, Burtrum C. and Paulsen, Monrad G., Psychiatric evidence in legal tests of insanity, A-34 (Oct.)
Schmitz, Herbert E. and Isaacs, John H., Ovarian tumors, 127
Scott, Wendell G., Isolated polyps in the colon as a source of intestinal bleeding, 222
Sexton, Daniel L., Office endocrinology, 236
Smith, Scott M. and Hruska, Edward J., The traumatized patient; evaluation, preparation and anesthetic management, 456
Snyder, Howard E., Trauma in rural areas, 332
Soffer, Alfred, Office diagnosis and treatment of essential hyperlipemia, 83
Stearns, Samuel, A rational approach to normoglycemia in treatment of diabetes mellitus, 451
Stutsman, A. C., Hoarseness, 212

Thompson, J. William and Thompson, J. William, III, Colonic diverticulitis: Changing concepts in surgical management, 243
Thompson, J. William, III, *see* Thompson, J. William
Thompson, Kenneth W., The intrinsic factor of Castle, 390

Vaughan, Victor C., III, Current status of hemolytic disease of the newborn, 115

Waldman, Samuel, *see* Pelner, Louis
Walters, Waltman and Chamberlain, Digby, Pancreatic lesions, 301
Wilson, Gale E., Heart disease simulating trauma, A-36 (Sept.)
Woodruff, J. Donald, Lesions of the vulva, 341

Zinninger, Max M., Differential diagnosis of jaundice, 409

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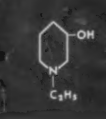

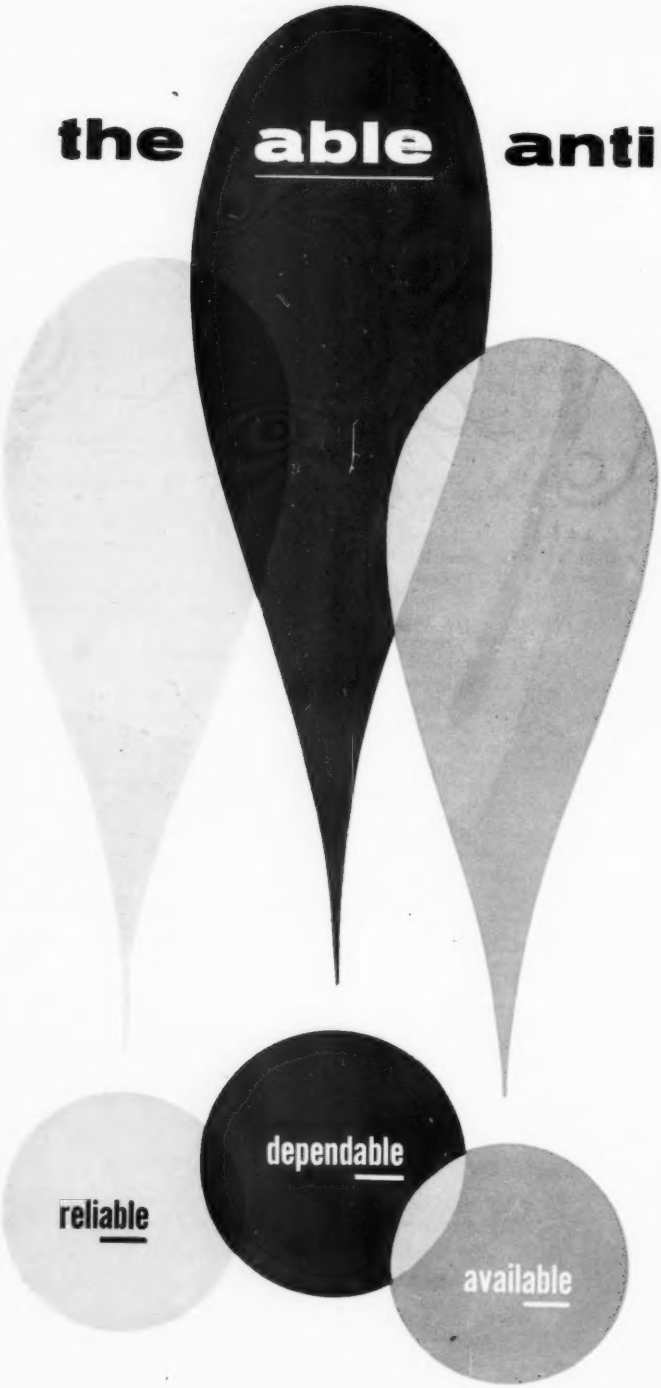
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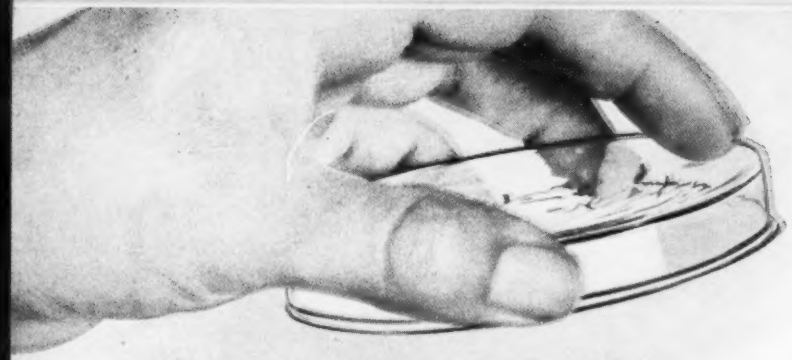

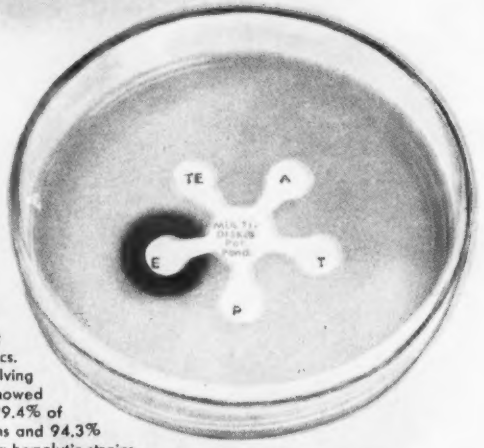

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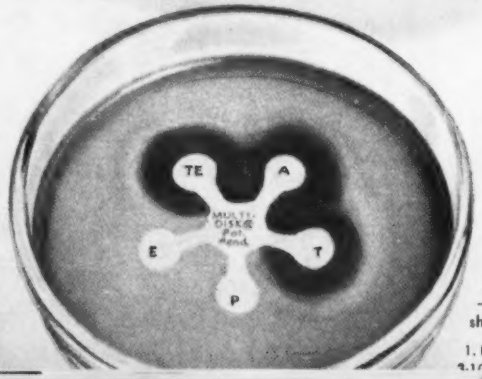

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1. Eisenberg, et al., Antib. & Chemo., 3:1024-1028, Oct. 1953

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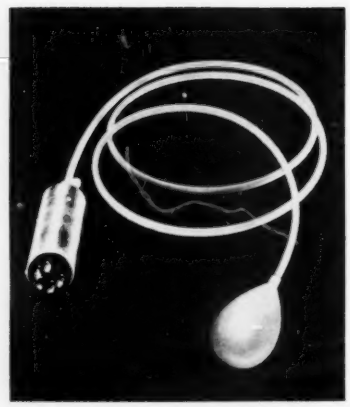

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DOSAGE AND ADMINISTRATION: Elixir Pediatric: Usual dosage is 0.03 to 0.05 mg. per pound of body weight orally over a 24 hour period. It is recommended that dosage be given at six hour intervals in three equal doses. Additional dose may be given six hours after the last, if required. Maintenance dose is usually 20 to 40 per cent of total digitalizing dose, or approximately 0.01 mg. per pound in single or divided dose, according to individual response.

Information on dosage of tablets available on request to manufacturer.
HOW SUPPLIED: Tablets, in bottles of 100 and 1000; solution, in bottles of 2 fl. oz., with dropper calibrated to 1 cc. in graduations of 0.02 cc.
PRODUCER: Burroughs Wellcome & Co. Inc., Tuckahoe, N.Y.

• CORTEF INTRAMUSCULAR

PURPOSE: For patients unable to take medication orally.
COMPOSITION: Each cubic centimeter of sterile aqueous suspension of hydrocortisone contains 50 mg. of hydrocortisone in sodium chloride injection with 4 mg. polysorbate 80 and 5 mg. carboxymethylcellulose. Readily absorbed, the hydrocortisone is preserved with benzyl alcohol 0.9 per cent w/v.
DOSAGE AND ADMINISTRATION: Varies with different indications. As a temporary substitute for oral Cortef therapy, a single injection each 24 hours equivalent to daily oral dose is customarily employed and is usually sufficient.
HOW SUPPLIED: In 5 cc. rubber-capped vials.
PRODUCER: The Upjohn Company, Kalamazoo, Mich.

(Continued on page A-72)

KNOX Protein Previews

New Knox Food Exchange Chart
Eliminates Calorie Counting

To help your obese patients reduce and stay reduced, Knox introduced this year a new dieting plan based on the use of nutritionally tested Food Exchanges.[1] The very heart of this new dietary is a "choice-of-foods diet list" chart which presents diets of 1200, 1600 and 1800 calories.

Each of these diets may be easily modified to meet special needs. However, the important points for your patients are that the use of this chart eliminates calorie counting, permits the patient a wide range of food choices and dispels that old empty feeling by allowing between-meal snacks.

These advantages should make your management of difficult and average cases easier. If you would like a supply of the new Knox charts for your practice, just fill in the coupon below.

1. Developed by the U. S. Public Health Service assisted by committees of The American Diabetes Association, Inc. and The American Dietetic Association.

Chas. B. Knox Gelatine Co., Inc.
Professional Service Dept. PS-12
Johnstown, N. Y.

Please send me____copies of the new, color-coded "choice-of-foods diet list" chart.

YOUR NAME AND ADDRESS:

• CORNING PIPETS

DESCRIPTION: Two pipets for increased speed and efficiency in serologic work are an 8 in. V.D.R.L. type and a taper-top serologic type. The 8 in. pipet, a 0.5 ml. unit with 0.01 ml. graduations, is the shortest pipet available and is lighter than capillary types. The taper-top pipet permits easy insertion and removal of a cotton filter and helps prevent the plug from being forced into the bore. The smallest inside diameter of the taper is greater than the inside diameter of the tip to maintain equal flow characteristics. The tips are ground with a chip-resisting double bevel.
HOW SUPPLIED: The taper top unit is available in seven sizes, 0.1 ml. to 10 ml., graduations of 0.1 or 0.01 ml.
PRODUCER: Corning Glass Works, Corning, N.Y.

• PABALATE®-HC

PURPOSE: For therapy of rheumatoid arthritis and its variants, osteoarthritis, acute rheumatic fever, bursitis, fibrositis and neuritis.
COMPOSITION: Each tablet contains:

Hydrocortisone (alcohol)	2.5 mg.
Potassium salicylate	0.3 gm.
Potassium para-aminobenzoate	0.3 gm.
Ascorbic acid	50.0 mg.

CAUTION: Known hypersensitivity to salicylate, para-aminobenzoate or hydrocortisone is a contraindication. Any preparation containing corticosteroids should be avoided completely or administered with care to patients with acute psychosis, chronic nephritis, Cushing's syndrome, diabetes mellitus, peptic ulcer, pulmonary tuberculosis and to patients prone to thrombophlebitis. On high daily dosage of Pabalate-HC, symptoms of salicylism or hypercorticoidism dictate dosage reduction, but never abrupt cessation.
DOSAGE AND ADMINISTRATION: Adults, usually 2 tablets four times daily. Children, according to age and ability to swallow the tablets.
HOW SUPPLIED: Bottles of 100.
PRODUCER: A. H. Robins Co., Inc., Richmond, Va.

• FERGON® PLUS IMPROVED

PURPOSE: For treatment of all iron deficiency and macrocytic anemias.
COMPOSITION: In addition to Fergon, Winthrop's brand of ferrous gluconate, each Caplet contains ½ unit U.S.P. oral vitamin B_{12} with intrinsic factor concentrate, and therapeutic doses of folic and ascorbic acid.
DOSAGE AND ADMINISTRATION: Daily dose of 2 Caplets provides one full U.S.P. oral unit of antianemia activity.
HOW SUPPLIED: Bottles of 100 and 500.
PRODUCER: Winthrop Laboratories, Inc., New York.

• CORYBAN-VITERRA

PURPOSE: Combination cold relief agent and vitamin and mineral nutritional supplement.
COMPOSITION: Coryban contains salicylamide, acetophenetidin, caffeine, prophenpyridamine maleate, ascorbic acid and purified hesperidin. Viterra contains 10 vitamins and 11 minerals.
DOSAGE AND ADMINISTRATION: Adults, 2 capsules of Coryban at onset of symptoms and 1 every four hours after initial dose; 1 capsule of Viterra daily for 30 days. Children 6 to 12 years old, half the adult dosage. Children under six years old, as prescribed.
HOW SUPPLIED: Cartons containing one bottle of 12 Coryban capsules and one bottle of 30 Viterra capsules.
PRODUCER: J. B. Roerig & Co., division of Chas. Pfizer & Co., Inc., Chicago.

• HYPO-MATIC SYRINGE FILLER

DESCRIPTION: Chrome-plated brass Hypo-matic syringe filler holds bottle and syringe securely, permitting quick, accurate filling of hypodermic syringes.
HOW SUPPLIED: As desk model or wall mounting type.
PRODUCER: Medical Appliance Corp., Boonton, N. J.

(Continued on page A-74)

NEW

for MIGRAINE complicated by
–Nervous Tension
–G.I. Disturbances

CAFERGOT-PB®
SUPPOSITORY

Ergotamine tartrate	*2 mg.*
Caffeine	*100 mg.*
Bellafoline	*0.25 mg.*
Pentobarbital Sod.	*60 mg.*

Average Dose: 1 suppository at onset of attack; second after 1 hr., if necessary.

SANDOZ

Sandoz
PHARMACEUTICALS
HANOVER, N. J.

• AMERICAINE W/NEOMYCIN

PURPOSE: Topical anesthetic and antibiotic ointment to allay surface pain and itching and to combat infection in burns, wounds and noninfectious dermatoses.
COMPOSITION: Americaine w/neomycin contains 20 per cent dissolved benzocaine and 5 mg. neomycin sulfate in a water-soluble colorless base.
HOW SUPPLIED: In ½ oz. tubes.
PRODUCER: Arnar-Stone Laboratories, Inc., Mount Prospect, Ill.

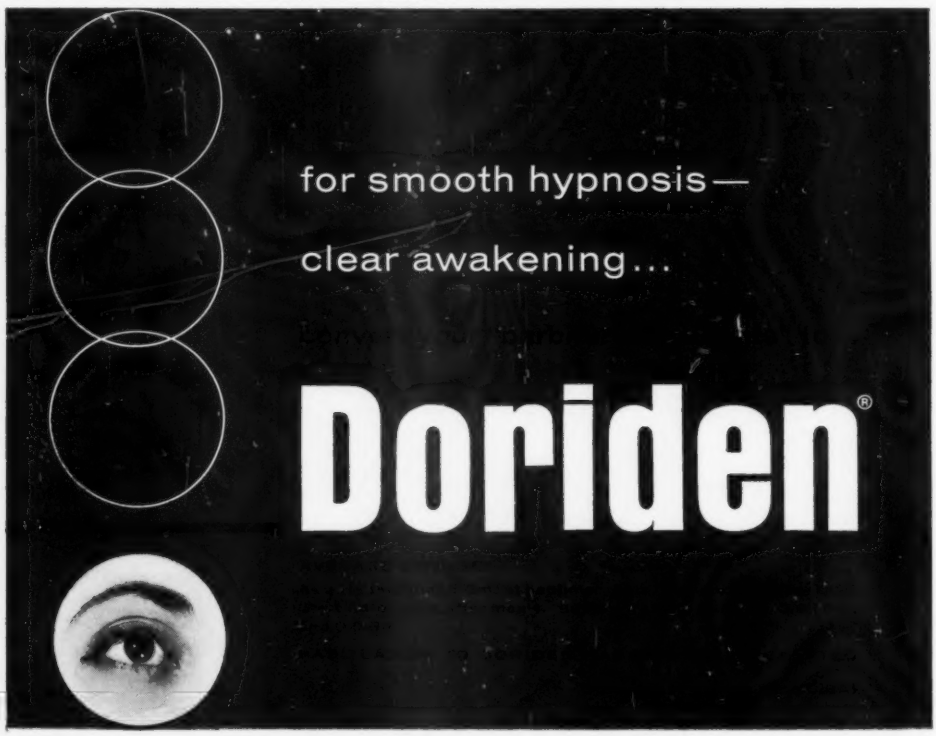
• HOMAGENETS

PURPOSE: Prophylaxis and treatment of multiple vitamin deficiencies.
DESCRIPTION: Homogenization divides the oily vitamins into microscopic particles, providing finer dispersion of oil- and water-soluble vitamins. They are more completely absorbed and better utilized. Tablets may be chewed, swallowed or allowed to dissolve.
DOSAGE AND ADMINISTRATION: Pediatric, 1 Homagenet daily; prenatal, 2 Homagenets three times daily; therapeutic, 1 or 2 Homagenets daily; or as prescribed.
HOW SUPPLIED: Three standard formulas: pediatric (orange flavor and color); prenatal (pink, mint-flavored), and therapeutic (chocolate flavor and color).
PRODUCER: The S. E. Massengill Company, Bristol, Tenn.

• BLADE CONTAINER

DESCRIPTION: Each box of Clip-Sharps contains 144 American Safety Razor surgical blades in units of 24 unwrapped blades per clip, protected by rust-inhibiting paper. The required number of blades, from 1 to 24, may easily be removed from the clip without handling individually wrapped blades.
PRODUCER: American Safety Razor Corp., New York.

(Continued on page A-78)



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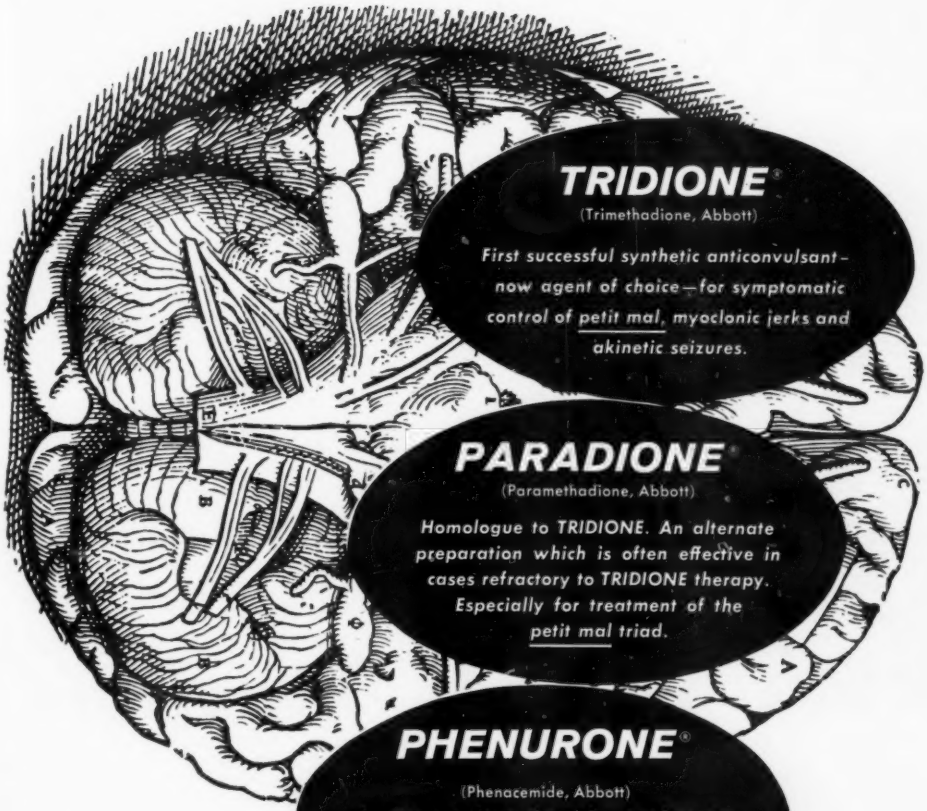


TRIDIONE®

(Trimethadione, Abbott)

First successful synthetic anticonvulsant—now agent of choice—for symptomatic control of petit mal, myoclonic jerks and akinetic seizures.

PARADIONE®

(Paramethadione, Abbott)

Homologue to TRIDIONE. An alternate preparation which is often effective in cases refractory to TRIDIONE therapy. Especially for treatment of the petit mal triad.

PHENURONE®

(Phenacemide, Abbott)

A potent anticonvulsant for psychomotor epilepsy, grand mal, petit mal and mixed seizures. Often successful where all other therapy has failed.

–fit your anticonvulsant therapy to the **specific** seizure type

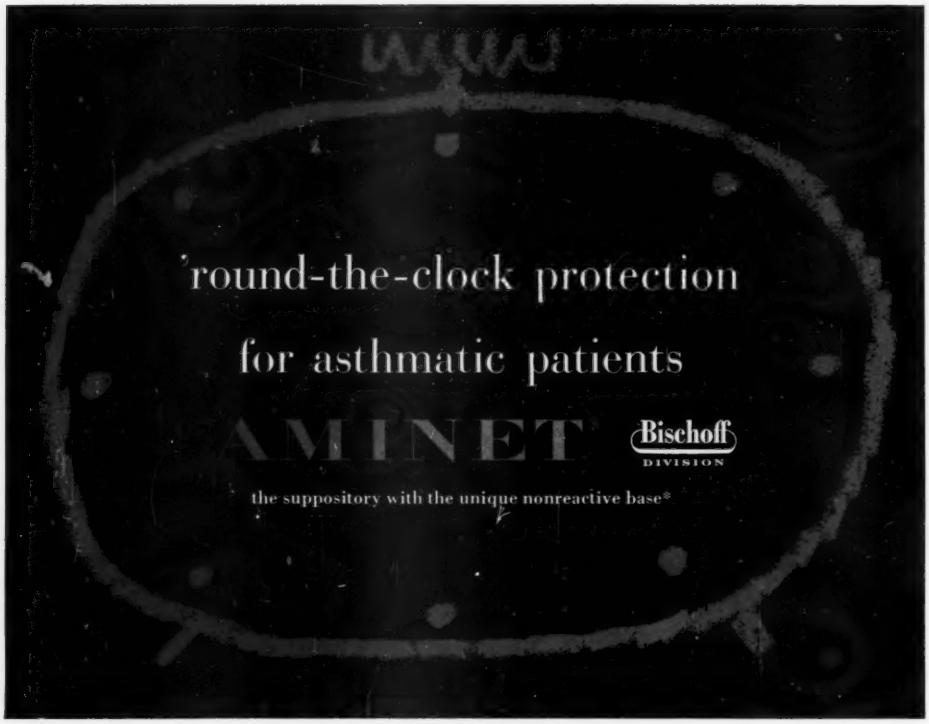
GEMONIL®

(Metharbital, Abbott)

A new drug of low toxicity for grand mal, petit mal, myoclonic and mixed seizures. Effective in disorders symptomatic of organic brain damage.

Abbott

1058089



terminates acute attacks—often in 20 minutes
prevents recurrences—half-strength suppository 2 or 3 times daily

safe—avoids the hazards of parenteral medication

effective—acts even in epinephrine-fast patients

stable—special nonreactive base* avoids deterioration, ensures full therapeutic effect

*melts at body temperature

Supplied: Boxes of 12, full strength—aminophylline 0.5 Gm. (gr. 7½), sodium pentobarbital 0.1 Gm. (gr. 1½). Also available in half strength.

AMES COMPANY, INC • ELKHART, INDIANA
64555

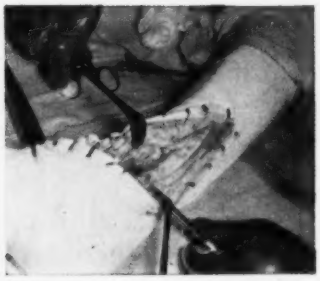
Surgical correction of NONUNION OF TIBIA

May, 1954.

August, 1954.

February, 1955.

RADIOGRAPHS: A-P preoperative and postoperative.



COLOR PHOTOGRAPHS: Surgical repair—6 views; this page and page following.

1. Left leg showing adherent scar over tibia. Large pedicle flap graft from opposite leg extends over to fibula.

2. Exposed *peroneus longus* muscle and fibula. Scarred extensor muscles being retracted from tibia and fibula.

3. Fibula sectioned about 4 centimeters above *malleolus*, and is being mobilized for insertion into tibia.

SEEING TODAY what the physician saw—and did—yesterday

A great part of the value of radiography and photography is that they preserve *today's* medical information for *tomorrow's* study. Thus, students, teachers, physicians view and re-view. They see first, the radiographs used in diagnosis and treatment . . . then follow, step by step, photographic records of surgery and pathology . . . are able to do this again and again.

Kodak
TRADE MARK

May, 1954.

August, 1954.

February, 1955.

RADIOGRAPHS: Lateral preoperative and postoperative.

COLOR PHOTOGRAPHS: Continued from preceding page.

4. Foot displaced laterally correcting varus. Fibula being fastened into lateral side of tibia.

5. Stainless steel screw holds fibula firmly in cavity. Bone fragments packed in to insure solid healing.

6. Space between fibula and tibia above nonunion packed with autogenous cancellus bone and cortical bank bone.

For radiography:
Kodak Blue Brand X-ray Film meets the most exacting requirements.

For color photography:
Kodachrome Film for miniature and motion picture cameras:

Kodak Ektachrome Film and Kodak Ektacolor Film, Type B, for sheet-film cameras;

Kodak Ektachrome Roll Film for roll film and miniature cameras.

Order x-ray products from your x-ray dealer, photographic products from your photographic dealer.

EASTMAN KODAK COMPANY, *Medical Division*, Rochester 4, N.Y.

Kodak

more uses for

Diamox*

Acetazolamide *Lederle*

This remarkable and versatile oral diuretic has proved its ability to control the body's fluid balance—in cardiac edema, in glaucoma, in epilepsy. Now DIAMOX has been approved in still other conditions:

new use!

PREMENSTRUAL TENSION

Where fluid retention is a problem, a single daily dose beginning 5-10 days before menstruation markedly alleviates symptoms.

new use!

OBESITY

Without affecting appetite, DIAMOX helps control the weight of the obese patient who tends to retain water.

new use!

TOXEMIA and EDEMA of PREGNANCY

DIAMOX serves as adjunctive therapy in the treatment of gross or occult edema in toxemia of pregnancy.

DIAMOX in tablets of 250 mg.
in vials of 500 mg.

LEDERLE LABORATORIES DIVISION *AMERICAN Cyanamid COMPANY* PEARL RIVER, NEW YORK Lederle

*REG. U.S. PAT. OFF.

• VISICALL

DESCRIPTION: "Electronic eye" monitor with speaker hookup to enable floor nurse to see into patient's room from her station. Picture of patient's room flashes on monitor-scope simultaneously with strip giving patient's name, room number and doctor's name. Patient-controlled switch cuts off speaker and camera if privacy is desired.
PRODUCER: Sperti Faraday, Inc., Adrian, Mich.

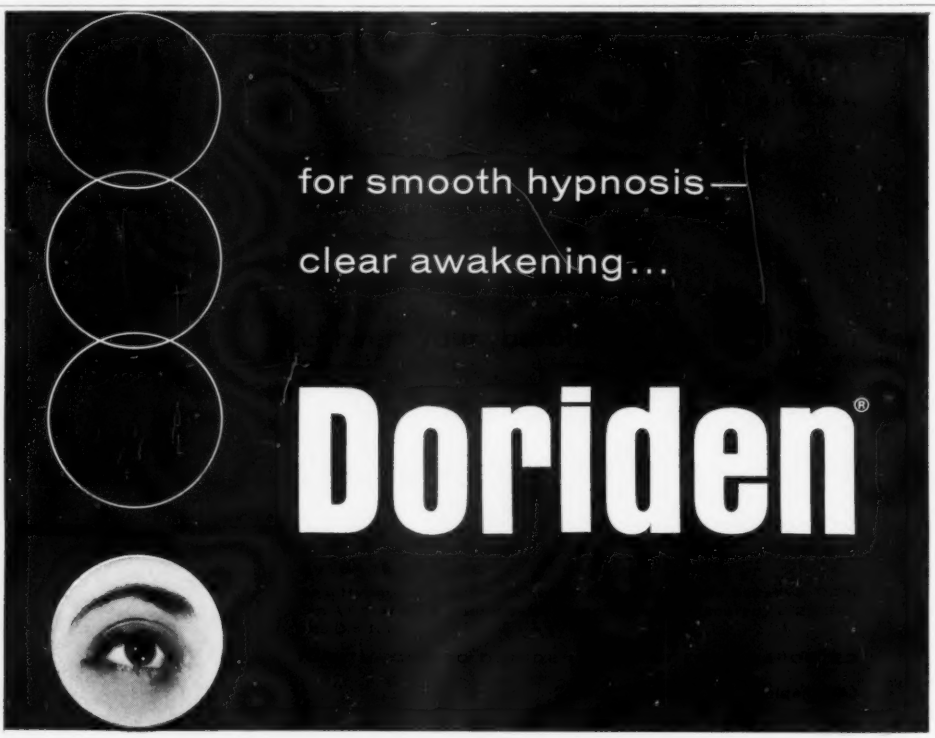
• CORTROPHIN-ZINC

PURPOSE: Treatment of conditions amenable to ACTH therapy, especially where natural stimulation of adrenocortical function is desired.
COMPOSITION: Each cubic centimeter contains 40 U.S.P. units of corticotrophin with zinc hydroxide (2.0 mg. of zinc) in aqueous suspension.
INDICATIONS FOR USE: Treatment of shock, rheumatoid conditions, allergic reactions and skin and eye diseases.
DOSAGE AND ADMINISTRATION: According to individual needs. Each cubic centimeter provides therapeutic ACTH activity for from one to three days.
HOW SUPPLIED: In 5 cc. vials.
PRODUCER: Organon Inc., Orange, N. J.

• STIMAVITE TASTITABS

PURPOSE: Appetite stimulant for children and adults.
COMPOSITION: Each lavender-colored, fruit-flavored tablet contains a special formulation of vitamins B_1, B_6 and B_{12}, ascorbic acid and the amino acid, l-lysine.
INDICATIONS FOR USE: For underweight patients, as an aid to growth and development in children, to help speed recovery in chronic illnesses, to shorten convalescence after acute illness, and in any conditions needing B_{12} therapy, excluding pernicious anemia.
DOSAGE AND ADMINISTRATION: One tablet daily or as directed by physician.
HOW SUPPLIED: Bottles of 30 tablets.
PRODUCER: J. B. Roerig and Company, division of Chas. Pfizer & Co., Chicago.

(Continued on page A-82)



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Now

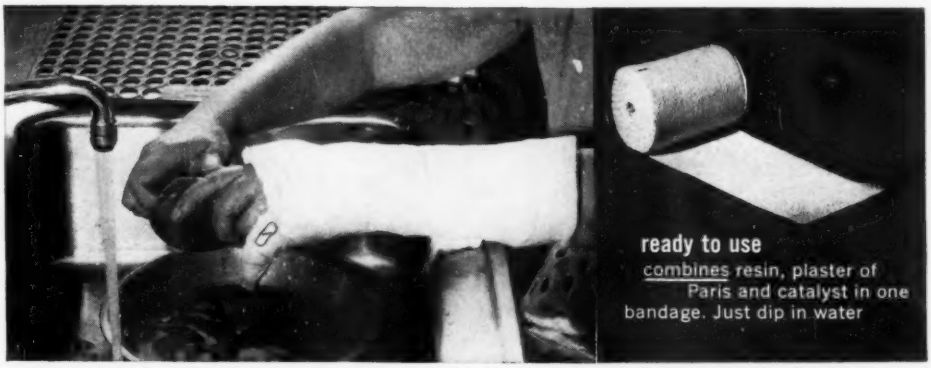
MELMAC®

resin plaster of Paris

BANDAGE

outmodes ordinary plaster

makes stronger, lighter, water-resistant casts



ready to use
combines resin, plaster of Paris and catalyst in one bandage. Just dip in water

▲

at last a water-resistant cast! Yet it's stronger than ordinary plaster! New casts of MELMAC® resin plaster of Paris BANDAGE can be washed—resist urine and wound exudate—are porous to water vapor. Are little affected by humidity or body moisture. Do not become soft, weak and soggy in humid weather as do ordinary plaster casts.

lighter, less fatiguing shoulder spica of MELMAC BANDAGE. Encourages prescribed exercise. Shortens hospital stay. Makes care easier. Bandage for bandage, MELMAC BANDAGE has 2 to 4 times the strength of ordinary plaster—is self-mending in the early molding stage. Fashion these better plastic casts with fewer bandages.

▶

Easy to apply and remove. 1. Just dip MELMAC BANDAGE into tepid water for 5 to 10 seconds. Squeeze out excess water thoroughly. Apply. 2. Use about half the usual number of rolls (or less). 3. Dispose of waste the same as with ordinary plaster. There is less mess. 4. Remove the thin cast easily with cast cutter, knife or cast saw. Send for sample.

Sensitivity: Since this product may contain traces of formaldehyde, persons who are known to be sensitive to it should be observed closely for dermatitis. Operators using the bandage repeatedly should wear rubber gloves if skin sensitivity exists.

Patent Applied For

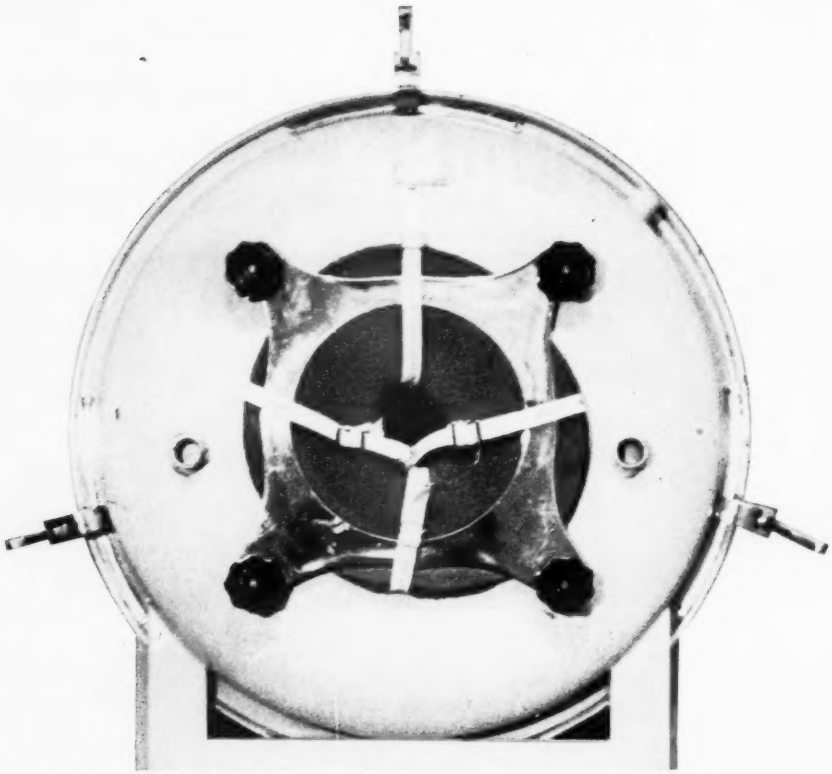
Davis & Geck

MELMAC®

resin plaster of Paris **BANDAGE**

Davis & Geck, Inc., a unit of American Cyanamid Company, Danbury, Connecticut.

Sutures and other surgical specialties



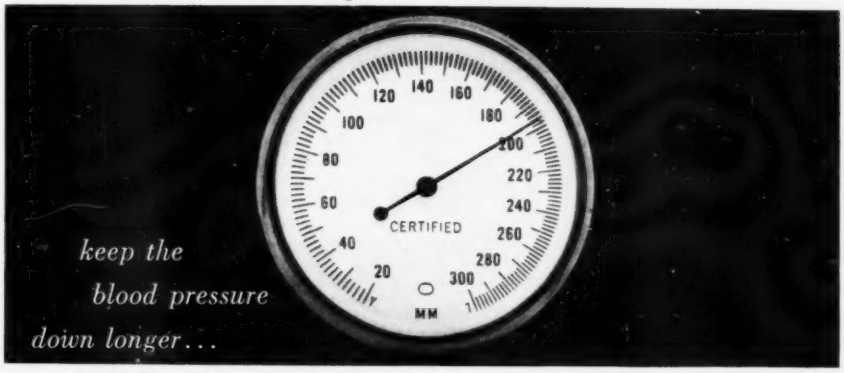
poliomyelitis
prophylaxis
pitman·moore
company

division of Allied Laboratories, Inc.
Indianapolis 6, Indiana

an original producer of poliomyelitis vaccine (Salk) and poliomyelitis-immune globulin ***(gamma globulin)*** *in one of America's largest biological laboratories*

Something more than "tension" is involved

...in most cases of HYPERTENSION



and the patient calm...with **Veralba/R***

PROTOVERATRINES A AND B WITH RESERPINE

Standardized with mathematical accuracy ... by chemical assay

In mild, moderate, and severe hypertension, VERALBA/R usually maintains blood pressure at approximately normal levels indefinitely. It offers "combined" drug therapy that is both safe *and* effective. Establishing precise dosage is a simple process with VERALBA/R, and side effects are usually insignificant.

Supplied in bottles of 100 and 1,000 scored tablets, each containing 0.4 mg. of protoveratrines and 0.08 mg. of reserpine.

*TRADEMARK

PITMAN • MOORE COMPANY

DIVISION OF ALLIED LABORATORIES, INC. INDIANAPOLIS, INDIANA

• MYOPURIN

PURPOSE: For all conditions where digitalis therapy is indicated.

COMPOSITION: Each uncoated tablet contains:

Digitoxin* (crystalline)	0.06 mg.
Gitalin* (amorphous)	0.19 mg.
Total glycoside content	0.25 mg.

*Cardiac glycosides of *Digitalis purpurea*.

CAUTION: Federal law prohibits dispensing without prescription.

DOSAGE AND ADMINISTRATION: The average digitalizing dose is 3 tablets daily for three or four days. The average maintenance dose is 1 tablet, or 0.25 mg., daily.

HOW SUPPLIED: Bottles of 100.

PRODUCER: The E. L. Patch Company, Stoneham, Mass.

• GLU-SALGIN CAPSULES

PURPOSE: Antirheumatic.

COMPOSITION: Each capsule contains 2½ gr. glucuronolactone, 1½ gr. dipyrone and 5 gr. SALRIN® (brand of salicylamide).

DESCRIPTION: An antirheumatic agent with the benefits of glucuronic acid therapy for pain relief in arthritis, bursitis, backache, gouty arthritis, sciatica, neuritis and neuralgia.

DOSAGE AND ADMINISTRATION: Initial dosage, 2 capsules four times daily, after meals and at bedtime. Maintenance dosage, 2 capsules twice daily.

HOW SUPPLIED: Bottles of 100 and 500.

PRODUCER: The Warren-Teed Products Company, Columbus, Ohio.

• LITTLE OTTO, FOOT AND LEG REST

PURPOSE: To protect the popliteal space in edema due to heart disease, diseases of the blood vessels of the legs and feet, orthopedic conditions calling for elevations with mobility, and all circulatory disturbances, as well as for relaxation.

DESCRIPTION: Little Otto is essentially composed of two shaped boards of laminated hardwood, approximately equal in length to the distance between the knee and ankle, and adjustable for individual comfort.

PRODUCER: Little Otto Company, Chicago.

'. . . Keep my temper down'

Statement from an emotionally unstable farm boy who received Serpasil in a recent study. This patient was 1 of 3 individuals with some form of character neuroses who were treated with Serpasil.

Drake, F. R., and Ebaugh, F. G.: Ann. New York Acad. Sc. 61:198 (April 15) 1955.

Supplied: *Tablets*, 0.1 mg., 0.25 mg. (scored), 1.0 mg. (scored), 2.0 mg. (scored), 4.0 mg. (scored). *Elixir*, 0.2 mg. per 4 ml.

PSYCHIATRIC USE ONLY: *Elixir*, 1.0 mg. per 4 ml.; *Parenteral Solution*, 2-ml. ampuls, 2.5 mg. per ml.

Serpasil®

(reserpine CIBA)

CIBA Summit, N. J.

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Better Patient Cooperation

Because of Simpler, More Effective Combination Therapy in hypertension

Greater Efficacy from smaller dosage

Side actions fewer and of lessened intensity

No complicated dosage schedules

Simpler patient management

Rauwiloid® + Veriloid®

A Riker Single-tablet Preparation

Indicated in moderately severe hypertension. Each tablet contains 1 mg. Rauwiloid and 3 mg. Veriloid.

Initial dosage, one tablet t.i.d., p.c. In bottles of 100 tablets.

Rauwiloid® + Hexamethonium

A Riker Single-tablet Preparation

Indicated in rapidly progressing, otherwise intractable hypertension. Each tablet contains 1 mg. Rauwiloid and 250 mg. hexamethonium chloride dihydrate.

Initial dosage, one-half tablet q.i.d. Available in bottles of 100 tablets.

Riker LABORATORIES, INC., LOS ANGELES

modern
unique
exclusive

Of 205 patients with

VAGINITIS

due to various etiologic agents, 189 reported "good or excellent" symptomatic response following therapy with CORTRIL Vaginal Tablets.*

Cortril®

brand of hydrocortisone

vaginal tablets

supplied: As 10 mg. white tablets in packages of 10.

Pfizer

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

*Personal communications

Products by Therapy Indications

PHARMACEUTICALS

Analgesics and Narcotics

Cafergot-PB—Sandoz A-73
Coricidin Tablets—Schering ..... Opp. A-92-93
Protamide—Sherman A-32

Anesthetics, Topical

Americaine with Neomycin—Arnar-Stone A-74
Tronothane—Abbott A-35

Antacids and Intestinal Adsorbents

Maalox—Rorer A-112

Antiarthritics

Cortef Intramuscular—Upjohn A-70
Glu-Salgin Capsules—Warren-Teed A-82
HydroCortone-T.B.A.—Sharp & Dohme A-17
Meticortelone—Schering A-12-44-88-116
Pabalate-HC—Robins A-72
Sigmagen—Schering A-6-7
Sterane—Pfizer A-3

Antiasthmatics

Aminet—Ames ..... A-
Nephenalin—Leeming ..... A-

Antibacterials

Gantrisin—Hoffmann-La Roche ..... Opp. A-16-

Antibiotics

Achromycin-SF—Lederle A-66-
Aureomycin—Lederle A-54-
Bicillin-Vee—Wyeth ..... A
Erythrocin—Abbott A-68-
Mysteclin—Squibb A-94-
Pentids—Squibb ..... A-
Pen-Vee Oral—Wyeth A-99-102-1
Remanden—Sharp & Dohme ..... Second Cov
Terramycin—Pfizer ..... A-
Tetrabon—Pfizer A-1
Tetrabon SF—Pfizer A-1
Tracinets—Sharp & Dohme ..... Third Cov

(Continued on page A-86)

To build giant-size appetites, prescribe...

Redisol®

CRYSTALLINE VITAMIN B_{12}

MAJOR ADVANTAGES: Helps youngsters gain weight. Stimulates hemopoiesis. Cherry-flavored *Elixir* or soluble *Tablets* readily blend with milk, juices, infant formulas.

Supplied as REDISOL *Tablets:* 25,50, 100, 250 *mcg.; Elixir: 5 mcg.* per 5 cc.; *Injectable:* 30, 100, 1000 *mcg.* per cc.

SHARP & DOHME

Philadelphia 1, Pa.
DIVISION OF
MERCK & CO., INC.

Anticholinergics

Antrenyl-Phenobarbital—Ciba A-46-47
Pathilon—Lederle A-13
Piptal—Lakeside A-65
Tricoloid—Burroughs Wellcome A-124

Anticonvulsants

Gemonil—Abbott A-75
Hibicon—Lederle A-97
Mysoline—Ayerst A-57
Paradione—Abbott A-75
Phenurone—Abbott A-75
Tridione—Abbott A-75

Antidiarrheals

Streptomagma—Wyeth A-37

Antispasmodics

Tridal—Lakeside A-64

Cardiovascular Agents

Butiserpine—McNeil A-93
Digoxin Elixir Pediatric—Burroughs Wellcome A-70
Digoxin Tablets—Burroughs Wellcome A-70
Levophed—Winthrop A-8
Myopurin—Patch A-82
Quinidine Sulfate—Davies, Rose A-108
Raudixin—Squibb A-25
Rauwiloid—Riker A-28
Rauwiloid-Hexamethonium—Riker A-83
Rauwiloid-Veriloid—Riker A-83
Sandril with Pyronil—Lilly A-33
Serpasil—Ciba ..... A 22-23
Serpasil-Apresoline—Ciba A-22-23
Veralba-R—Pitman-Moore A-81

Central Nervous Stimulants

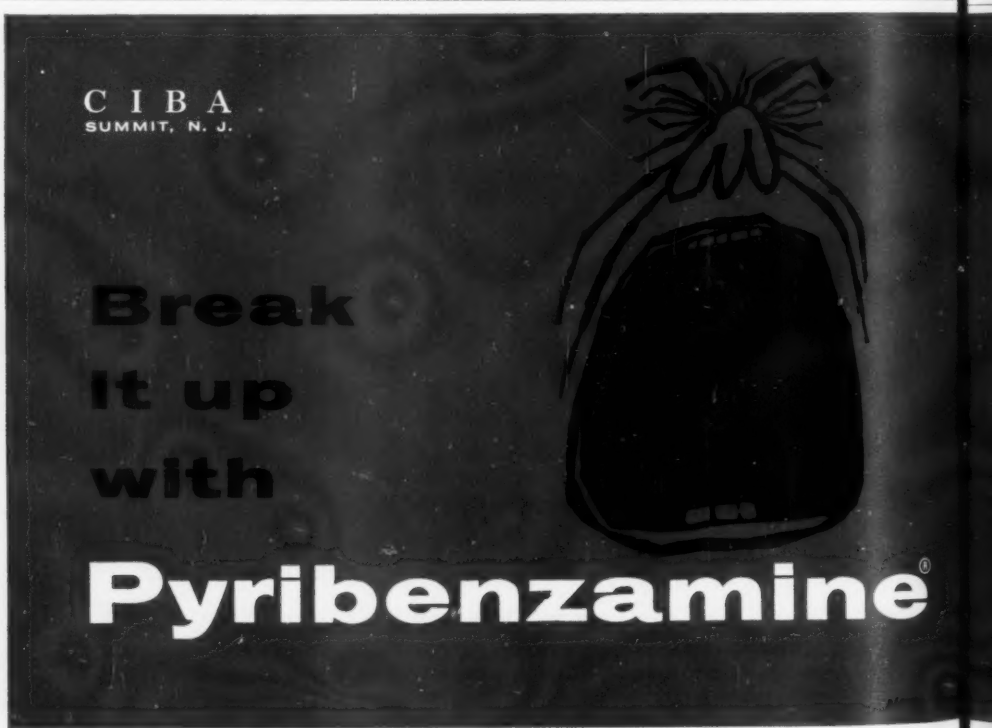
Desbutal—Abbott A-30-31

Coagulants

Koagamin—Chatham A-38
Mephyton—Sharp & Dohme A-117

Dermatologic Preparations

Calmitol—Leeming A-100
Desitin Ointment—Desitin A-111



Eurax—Geigy A-27
Premarin Lotion—Ayerst A-113

Diagnostic Aids

Clinitest—Ames A-2

Diuretics

Diamox—Lederle A-77

Hematinics

Fergon Plus Improved—Winthrop A-72
Mol-Iron—White A-39
Perihemin—Lederle A-43
Rarical—Ortho A-49

Hormones and Steroids

Cortrophin-Zinc—Organon A-78
HP Acthar Gel—Armour A-26

Immunizing Agents

Mumps Vaccine—Lederle A-99
Poliomyelitis Vaccine—Pitman-Moore A-80

Laxatives

Kondremul—Patch A-10
Metamucil—Searle ..... A-

Muscle Relaxants

Equanil—Wyeth A-11
Miltown—Wallace A-1

Ophthalmic Preparations

Neosporin Ophthalmic Solution—Burroughs Wellcome .. A-4

Reducing Aids

Am Plus—Roerig A-6

Respiratory Infection Medications

Clistanal—McNeil A-4
Coricidin Syrup—Schering ..... Opp. A-92-9
Coryban-Viterra—Roerig A-7
Pyribenzamine Expectorant—Ciba A-10-11-86-8
Rhinalgan—Doho A-2
Romilar—Hoffmann-La Roche ..... Opp. A-16-1
Toclase—Pfizer A-5
Tyzine—Pfizer A-10

(Continued on page A-88)

PYRIBENZAMINE CITRATE (30 mg. per 4 ml.)
Relieves Congestion

EPHEDRINE SULPHATE (10 mg. per 4 ml.)
Relaxes Bronchioles

AMMONIUM CHLORIDE (80 mg. per 4 ml.)
Liquefies Mucus

Also available: Pyribenzamine Expectorant with Codeine and Ephedrine (above formula plus 8 mg. codeine phosphate per 4 ml.); exempt narcotic.

PYRIBENZAMINE® citrate (tripelennamine citrate CIBA)

Expectorant
with Ephedrine

MEDICAL HORIZONS TV Monday P.M. Sponsored by CIBA ABC-TV

Products by Therapy Indications—*Continued*

Sedatives and Hypnotics

Doriden—Ciba ..... A-74-78-90-Fourth Cover
Nembu-Serpin—Abbott A-107
Noludar—Hoffmann-La Roche A-109
Serpasil—Ciba A-20-82
Serpasil Elixir—Ciba A-122-123

Vaginal Antiseptics

Cortril—Pfizer A-84
Triple Sulfa Cream—Ortho A-101

Vasodilators

Ilidar—Hoffmann-La Roche A-103
Peritrate—Warner-Chilcott A-115
Roniacol—Hoffmann-La Roche A-103

Vitamins and Nutrients

Calcisalin—Warner-Chilcott A-16
Folbesyn—Lederle A-40
Geriplex—Parke, Davis A-61
Homagenets—Massengill A-74
Redisol—Sharp & Dohme A-85
Stimavite Tastitabs—Roerig A-78
Stresscaps—Lederle A-89

DIETARY

Enriched Bread—American Bakers A-91
Evaporated Milk—Pet A-62
Gelatine—Knox A-71
Meat—American Meat A-52

INSTRUMENTS AND EQUIPMENT

Corning Pipets—Corning Glass A-72
Hypo-Matic Syringe Filler—Medical Appliance A-72
Maxiservice—General Electric A-59
Mediac—Nuclear-Chicago A-92
Rectal Instruments—Welch Allyn A-110
Safety Button for Oxygen Tent—Sperti Faraday A-70
Visicall—Sperti Faraday A-78

MISCELLANEOUS

B-P Formaldehyde Germicide—Parker, White & Heyl A-53
Clip-Sharps Surgical Blades—Am. Safety Razor A-74
Cosmetics—Revlon A-96
Insurance—Mutual of Omaha A-99
Little Otto, Foot and Leg Rest—Little Otto A-82
Melmac Bandage—Davis & Geck A-79
X-Ray and Photographic Supplies—Eastman ..... Opp. A-76-77

in rheumatoid arthritis

now available...the second
new Schering corticosteroid

METICORTelone

PREDNISOLONE (metacortandralone)

Schering

"possesses an augmented therapeutic ratio"
over cortisone and hydrocortisone

ML-J-57

METICORTELONE,* brand of prednisolone (metacortandralone).
*T.M.

After
severe infectious disease,
fractures and other trauma,
prolonged antibiotic therapy,
serious vitamin depletion,
second and third degree burns,
surgery

hasten
convalescence
with

STRESSCAPS*

Stress Formula Vitamins *Lederle*

Patients who suffer unusual physiologic stress need proper vitamin supplementation to hasten their convalescence. STRESSCAPS (based on the formula suggested by the National Research Council) provide the necessary vitamins in a *dry-filled* capsule for rapid and complete absorption. Average dose: in convalescence—1 capsule daily; in severe conditions—2 capsules daily.

Each capsule contains:	
Thiamine Mononitrate (B_1)	10 mg.
Riboflavin (B_2)	10 mg.
Niacinamide	100 mg.
Ascorbic Acid (C)	300 mg.
Pyridoxine HCl (B_6)	2 mg.
Vitamin B_{12}	4 mcgm.
Folic Acid	1.5 mg.
Calcium Pantothenate	20 mg.
Vitamin K (Menadione)	2 mg.

LEDERLE LABORATORIES DIVISION AMERICAN Cyanamid COMPANY PEARL RIVER, NEW YORK

Lederle

*REG. U. S. PAT. OFF.

The Medical Muse

RICHARD ARMOUR

NO QUESTION

I have a doctor friend who leads
A very special life.
He never needs to wonder just
How much to tell his wife.

He isn't asked (or begged or teased)
About each patient's ill.
His wife is not offended when
He says he must keep still.

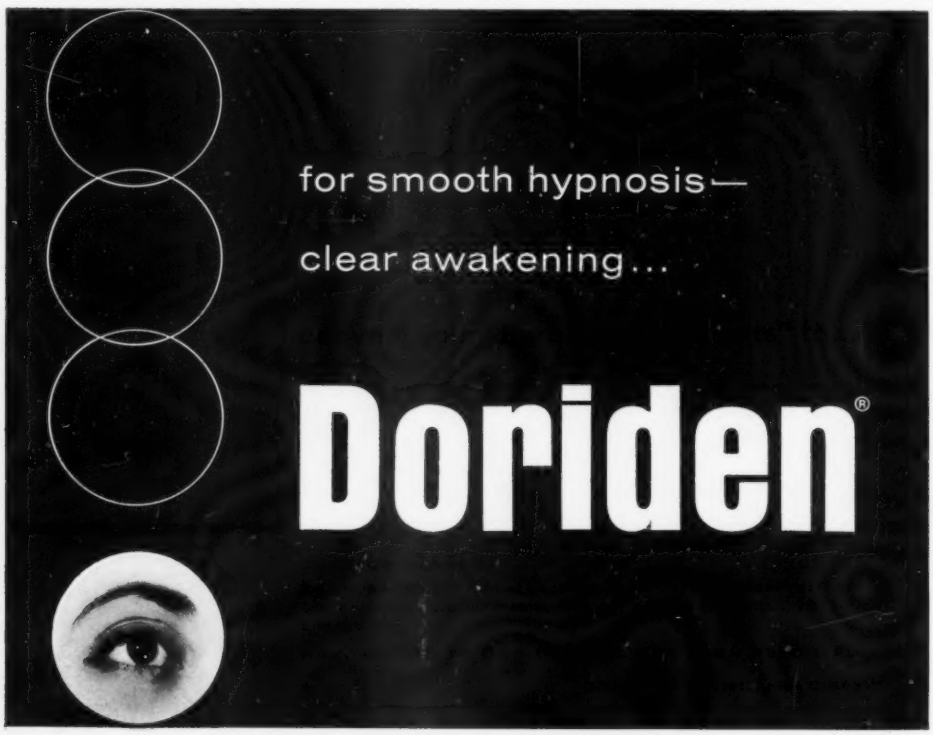
This friend of mine is rather young,
He's just hung out his shingle.
He keeps his patients' secrets well,
The reason is, he's single.

NOT FOR HIM

I'd like my son to grow to be
A surgeon, and he seems to be
Impressed with such a fine career,
But he's confessed a certain fear.

It's not the years and years of study,
It's not distaste for something bloody,
Nor that he'd have to carve a little—
He has a knife and likes to whittle.

No, what deters him from this calling,
In fact to him seems quite appalling,
A thing he hardly understands,
Is all that scrubbing of the hands.



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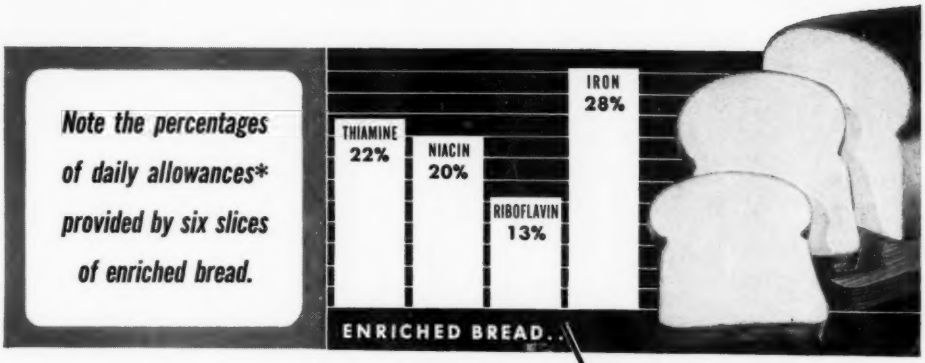
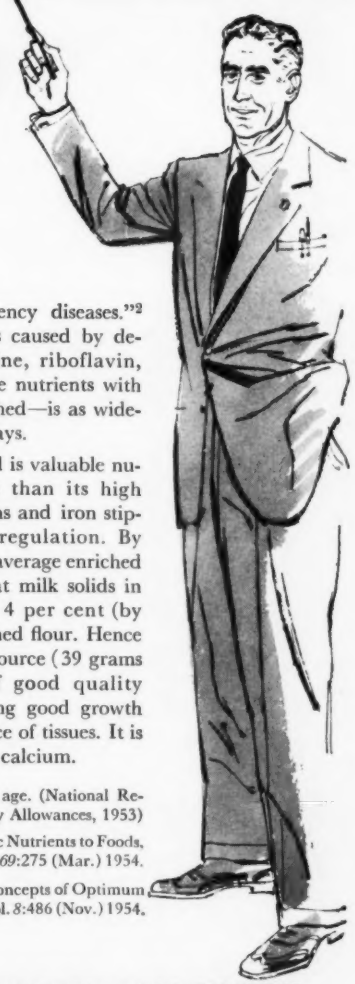


enriched bread

endorsed again by authorities on public health



ENRICHED BREAD, marketed since 1941, recently has been endorsed again by the Food and Nutrition Board of the National Research Council and by the Council on Foods and Nutrition of the American Medical Association.[1] This reaffirmation of endorsement in former years (1939, 1941, 1946) is based on "good evidence" that enriched bread has been "beneficial to the public," has "encouraged sound nutritional practices," and has contributed notably to "correcting deficiencies in the diets of the general population."

Nationally marketed enriched bread merits a large share of the credit for "the great gain in public health" in recent years, attributed to modern food commodities possessing high nutrient content. "Within the past two decades, for the first time in our history we have reached a national pattern of food practices that permits almost a complete escape from the classical forms of nutritional deficiency diseases."[2] None of the diseases caused by deficiencies of thiamine, riboflavin, niacin, and iron—the nutrients with which bread is enriched—is as widespread as in former days.

But enriched bread is valuable nutritionally for more than its high amounts of B vitamins and iron stipulated by official regulation. By commercial practice, average enriched bread contains nonfat milk solids in amounts averaging 4 per cent (by weight) of its contained flour. Hence it also represents a source (39 grams per pound loaf) of good quality protein for supporting good growth as well as maintenance of tissues. It is also a good source of calcium.

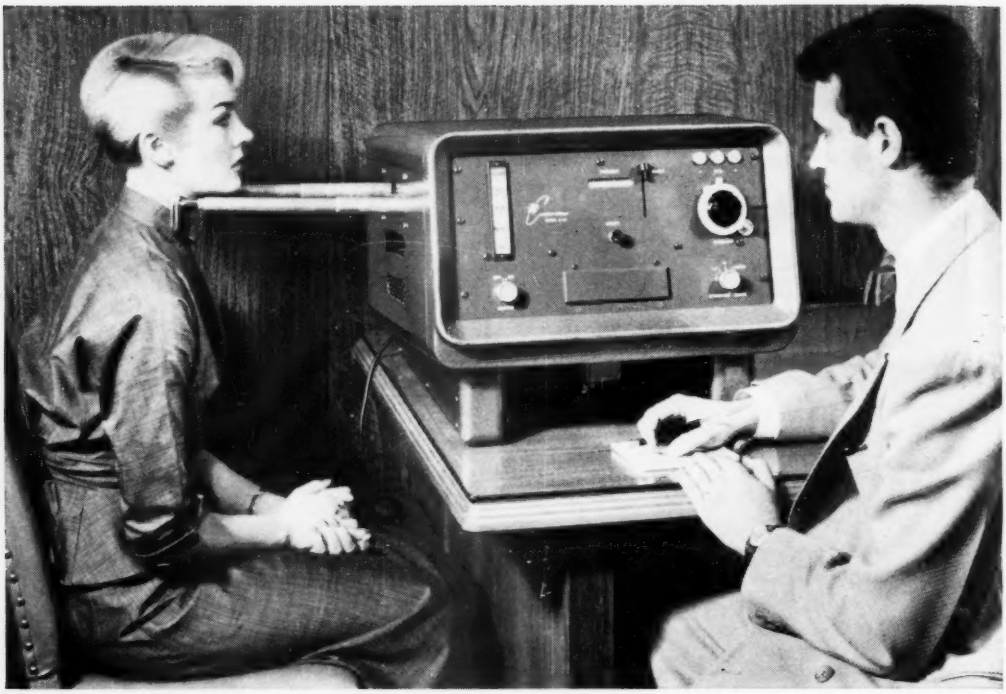
*For man 45 years of age. (National Research Council Dietary Allowances, 1953)

1. The Addition of Specific Nutrients to Foods, Public Health Reports *69*:275 (Mar.) 1954.

2. King, C. G.: Newer Concepts of Optimum Nutrition, Food Technol. *8*:486 (Nov.) 1954.

The nutritional statements made in this advertisement have been reviewed and found consistent with current medical opinion by the Council on Foods and Nutrition of the American Medical Association.

AMERICAN BAKERS ASSOCIATION
20 NORTH WACKER DRIVE, CHICAGO 6, ILL.



Patient is given a radioiodine capsule or solution by mouth. Identical dose is set aside as a "standard."

After a time lapse (usually 24 hours), the "standard" is measured* in the phantom neck. A single control then adjusts the "MEDIAC" for the patient.

Phantom is removed and activity in patient's thyroid is measured.* Uptake of radioiodine is directly related to thyroid function and shown as per cent of administered dose.

*Maximum time involved—2 minutes.

Diagnosis of Thyroid Function Simplified with Radioisotopes

The routine use of radioactive iodine (I^{131}) as an aid in the diagnosis of thyroid function has progressed to the point where every hospital, clinic and private physician should consider the merits of an isotope program.

The Mediac, shown in use at the left, is just one of a complete line of medical instruments manufactured by Nuclear-Chicago for use with radioactivity. Designed for the clinic or private physician, operation is simple, foolproof and rapid. Its price is surprisingly low.

Write for our catalog "O" for full information on the Mediac and other clinical radioisotope measuring equipment as well as complete details on fulfilling AEC requirements.

Leaders in Making Radioactivity Count

nuclear-chicago

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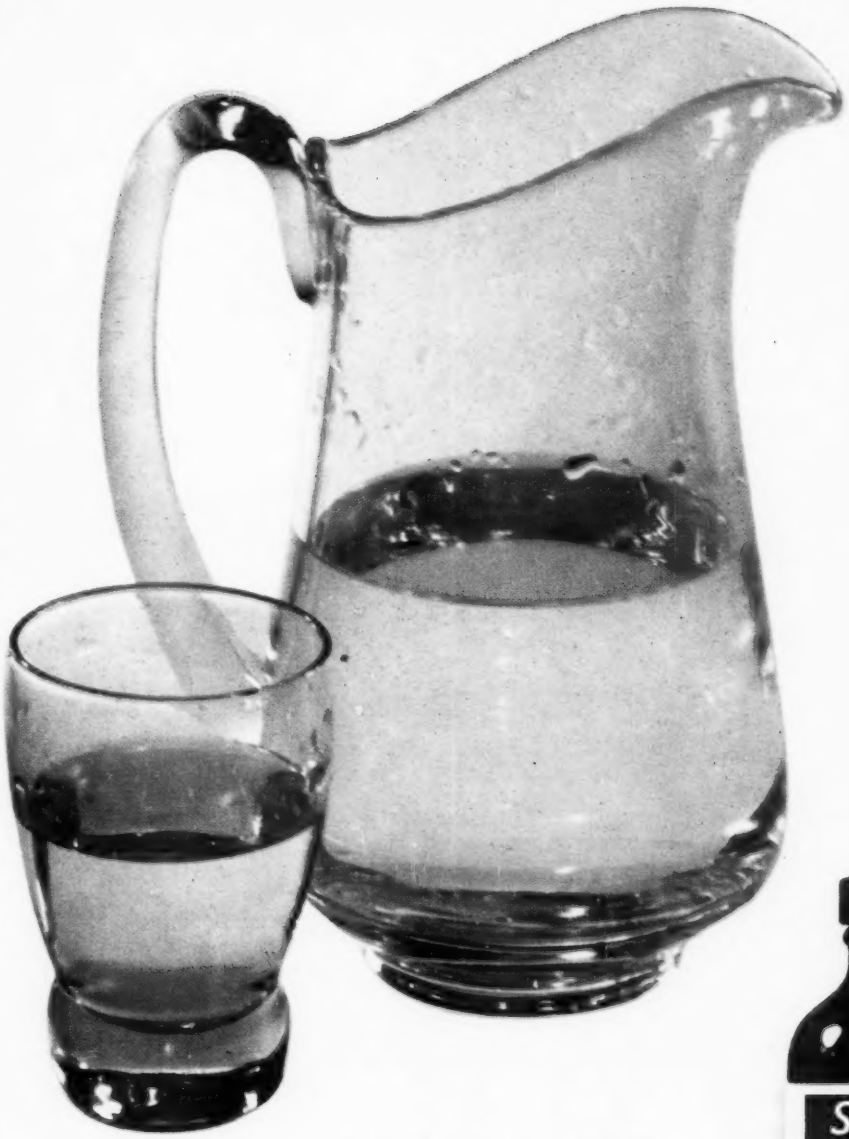
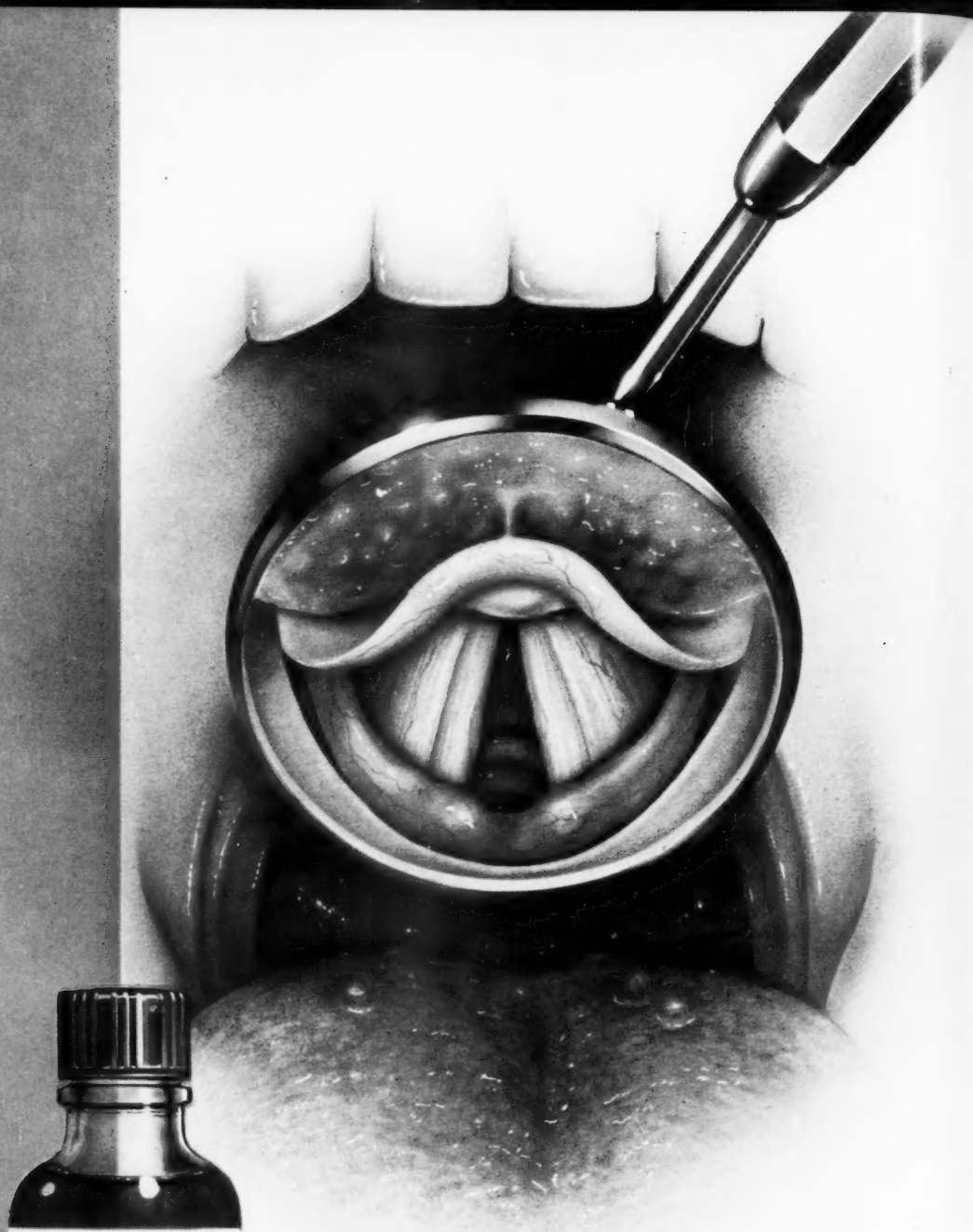
259 West Erie Street, Chicago 10, Illinois



best for colds

...and pain

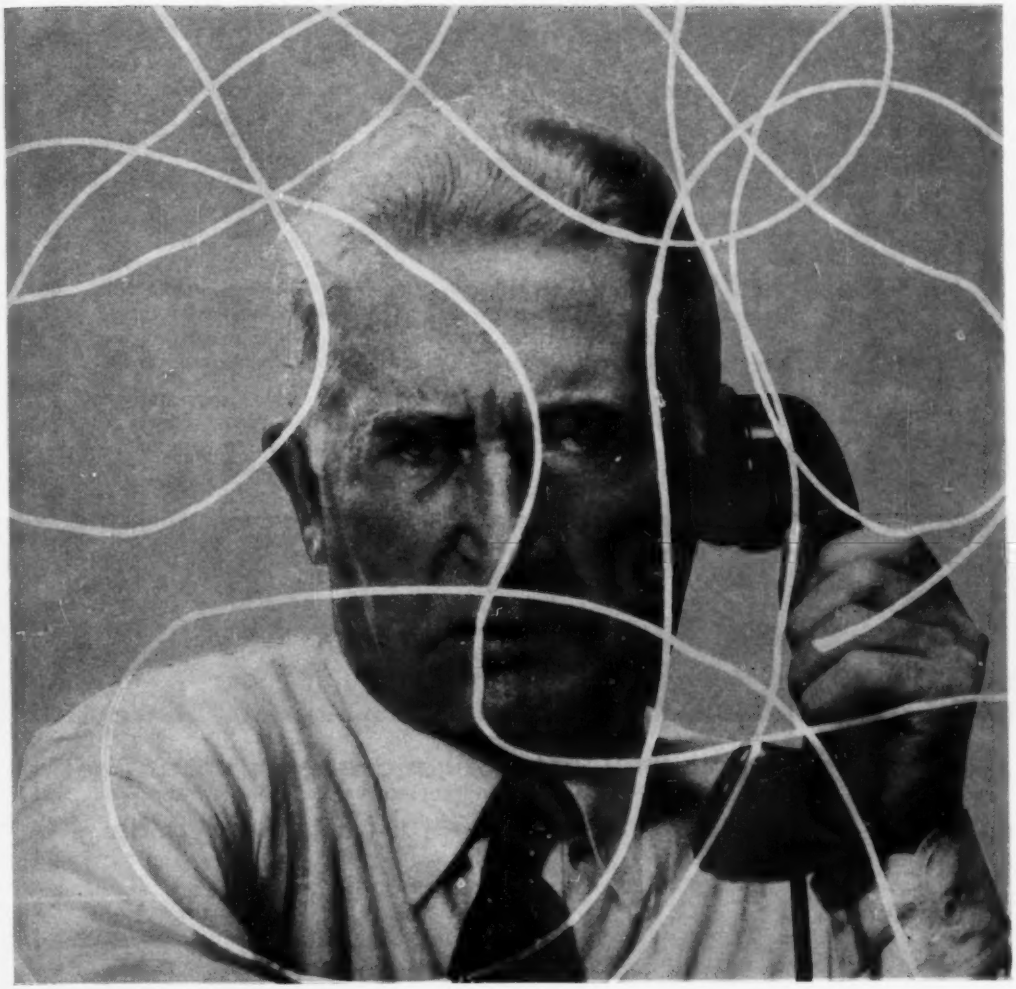
—plain—℈ ¼ gr. or ½ gr. codeine—℈ 150,000 units penicillin.



expressly for the coughing patient

CORICIDIN® Syrup* expressly formulated with dihydrocodeinone, CHLOR-TRIMETON® and other selected, effective antitussive and analgesic ingredients.

*Exempt narcotic.



TENSION IS TEMPERED...with

Butiserpine*

(Butisol and Reserpine)

"Just the right amounts" of two valuable, complementary drugs—Butisol* Sodium 15 mg. and Reserpine 0.1 mg.—to quickly relax tension and hold the patient on a smooth course, without disturbing side-effects.

BUTISERPINE—in cardiovascular-nervous conditions
tablets 100s and 1000s

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LABORATORIES, INC.
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*Trade-Mark

Mysteclin

STECLIN • MYCOSTATIN
(SQUIBB TETRACYCLINE-NYSTATIN)

well tolerated broad spectrum antibacterial therapy plus antifungal prophylaxis

Each MYSTECLIN capsule contains 250 mg. Steclin Hydrochloride and 250,000 units Mycostatin.

Minimum adult dose: 1 capsule q.i.d. *Supply:* Bottles of 12 and 100.

"MYSTECLIN", "STECLIN" AND "MYCOSTATIN"® ARE SQUIBB TRADEMARKS.

broad spectrum antibiotic therapy, effective in many common infections

Because it contains Steclin (Squibb Tetracycline), MYSTECLIN is an effective therapeutic agent for most bacterial infections. When caused by tetracycline-susceptible organisms, the following infections are a few of those which can be expected to respond to MYSTECLIN therapy:

bronchitis • colitis • furunculosis • gonorrhea • lymphadenitis • meningitis • osteomyelitis • otitis media • pneumonia • pyelonephritis • sinusitis • tonsillitis

MYSTECLIN is also indicated in certain viral infections and in amebic dysentery.

broad spectrum antibiotic therapy, with a minimum of side effects

In clinical use, Steclin has produced an extremely low incidence of the gastrointestinal distress sometimes observed with other broad spectrum antibiotics. Mycostatin (Squibb Nystatin), as contained in MYSTECLIN, is also a particularly well tolerated antibiotic and has produced no allergic reactions, even after prolonged administration.

broad spectrum antibiotic therapy, without the danger of monilial overgrowth

Because it contains Mycostatin, the first safe antifungal antibiotic, MYSTECLIN effectively prevents the overgrowth of Candida albicans (monilia) frequently associated with the administration of ordinary broad spectrum antibiotics. This overgrowth may sometimes cause gastrointestinal distress, anal pruritus, vaginitis, and thrush; on occasion, it may have serious and even fatal consequences.

SQUIBB

Revlon Nail Enamel

Revlon Aquamarine Lotion

Revlon Lanolite Lipstick

Revlon 'Love Pat'

Revlon 'Touch & Glow' Liquid Make-up & Face Powder

These, and all Revlon products

are made with the same scientific, exacting care as the highest standard ethical pharmaceuticals, using only the very purest and finest ingredients obtainable.

That's why more women use Revlon lipsticks than any other brand...

...And that's why more than 90% of the beauty salons in America use Revlon products professionally.

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Lederle

Hibicon*

Benzchlorpropamide *Lederle*

IN GRAND MAL AND PSYCHOMOTOR EPILEPTIC SEIZURES

HIBICON is a potent anticonvulsant which does not require reinforcement with sedatives. It is practically non-toxic, and patients are slow to develop a tolerance for it. It effects a feeling of well-being and heightened morale, without causing lethargy. The usual dosage is 0.5 Gm. to 1.5 Gm., 3 or 4 times daily, with meals and before retiring.

HIBICON is supplied in 250 mg. and 500 mg. capsules, in bottles of 100 and 1,000.

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PEARL RIVER, NEW YORK

THE MEDICAL *Bookman*

► CEREBRAL VASCULAR DISEASES

Edited by Irving S. Wright, M.D., Professor of Clinical Medicine, and E. Hugh Luckey, M.D., Dean, Cornell University Medical College, New York. 167 pages. 1955, Grune & Stratton, Inc., New York and London. $5.50.

There has been a trend in the past few years to conduct conferences by experts in a specific phase of research or education. The present volume on cerebrovascular diseases was such a conference, held in 1954 under the auspices of the American Heart Association, by experts in the basic sciences and in clinical medicine. Undoubtedly, these get-togethers are very stimulating and have brought about advancements in education and research. One wonders, however, whether the continued publication of such conferences is intended primarily for those who attend the conference, and probably their associates, or for the scientific reading public. At times there is a need for publishing these conferences for general consumption, but it appears that a great many have recently come to light. Could not all these conferences be reduced to the essential facts and important contributions by authorities instead of conversation between participants? The space occupied by the remarks of the chairman or moderator in introducing the next speaker or asking for questions seems unwarranted.

Surely, from these conferences there result some important bits of information. For example, the reader is told that in 1952, 170,000 people died of vascular lesions affecting the central nervous system, and that there are approximately 1,800,000 victims of cerebrovascular diseases in the United States today. Again, there appears the valuable information that cerebral arteriosclerosis is the second leading cause of first admissions to state mental hospitals, schizophrenia being the leading cause. Furthermore, 44,000 deaths from cerebrovascular diseases in 1952 were in the "working age" group of 25 to 64 years. Thus, there is an impact on the national economy from the standpoint of work production, inability to continue on the work program, care required for managing these sick people, and many other factors that affect sociologic, economic and personal changes.

Several aspects of this problem were reviewed at this conference. Aside from the sociologic and economic significance of cerebrovascular diseases, there was a comment on the embryology of cerebral circulation which could have been reduced to one or two paragraphs. The anatomy of the cerebral circulation and its clinical significance contains one important point, namely, that the adult human brain makes up only 2 per cent of the total body weight, consumes more than 10 per cent of the oxygen supply of the body and 17 per cent of the glucose supply, and receives 17 per cent of the total cardiac output. The arterial supply of the brain is far greater than is indicated by the relatively small proportion of the body made up by the brain. In the discussion on the pathology of cerebrovascular diseases, it is stated that 20 per cent of persons who die have some kind of vascular disease of the brain, though only a small number die as a result of the brain disease. The discussion on physiology of the cerebral circulation presents some important basic information, but the section on brain chemistry is more of conversation than information. Discussion of other aspects of the general subject completes the volume.

S. A. L.

(Continued on page A-100)

the greatest name in accident and health insurance...

Mutual OF OMAHA

HOME OFFICE: OMAHA, NEBRASKA
CANADIAN HEAD OFFICE: TORONTO
V. J. SKUTT, President

More Than 650 Million Dollars Paid in Benefits

Another Lederle "First"!

MUMPS VACCINE

A practical immunizing antigen for prevention of mumps in children or adults where indicated. Immunizes for about one year.
Packages: 2 cc. vial (1 immunization), 10 cc. vial (5 immunizations).

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AMERICAN Cyanamid COMPANY
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Lederle

PEN·VEE·*Oral**

Penicillin V, Crystalline (Phenoxymethyl Penicillin)

the totally new penicillin for decisive oral dependability

Supplied: Tablets, 125 mg. (200,000 units), bottles of 36. Also available: Tablets BICILLIN®-VEE, 100 mg. (100,000 units) of benzathine penicillin G and 62.5 mg. (100,000 units) of penicillin V, bottles of 36.

Wyeth
Philadelphia Pa.

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► RADIOLOGY FOR MEDICAL STUDENTS

By Fred Jenner Hodges, M.D., Professor and Chairman, Isadore Lampe, M.D., Professor, and John Floyd Holt, M.D., Professor, Department of Radiology, University of Michigan, Ann Arbor. Ed. 2. 439 pages with 106 illustrations. 1954, The Year Book Publishers, Inc., Chicago. $8.00.

Even without revisions and additions, this book would still be the best introduction to general diagnostic and therapeutic branches of radiology for medical students, interns and beginners in the field. The basic plan and material of the first edition have been preserved. Needless to say, the more practical applications of the newer developments in the field have been added.

In the diagnostic field, the basic principles and applications of angiocardiography in congenital heart disease have been included. Normal as well as pulmonary stenosis, tetralogy of Fallot, atrial septal defect and coarctation are discussed and illustrated. The use of aortography and its application, and the use of retroperitoneal air insufflation also have been added to this text.

From the therapeutic viewpoint, the basic text covering the physical and clinical branches of the specialty has been expanded to include the practical aspects of supervoltage therapy, and the theoretical and clinical application of isotopes in medicine, especially in the treatment of carcinoma of the thyroid with I^{131}.

Newer refinements of the classification of carcinoma of the cervix have been included. Results of oral malignancy therapy and breast statistics are brought up-to-date.

S. B. F.

► THE GENESIS AND PREVENTION OF CANCER

By W. Sampson Handley, M.D., Consulting Surgeon to the Middlesex Hospital, London. Ed. 2. 320 pages with 113 illustrations. 1955, The Macmillan Company, New York. $4.00.

Ideas and theories of the etiology of cancer, subjects which the author has investigated for almost 50 years, are contained in this new and revised edition.

(Continued on page A-102)

WHILE YOU WERE OUT

Message. Dr. Greene returned your call—said thanks for reminding him of Calmitol, and that it stopped Mr. B's itching overnight. Said he's been afraid to try anything that might aggravate or sensitize.

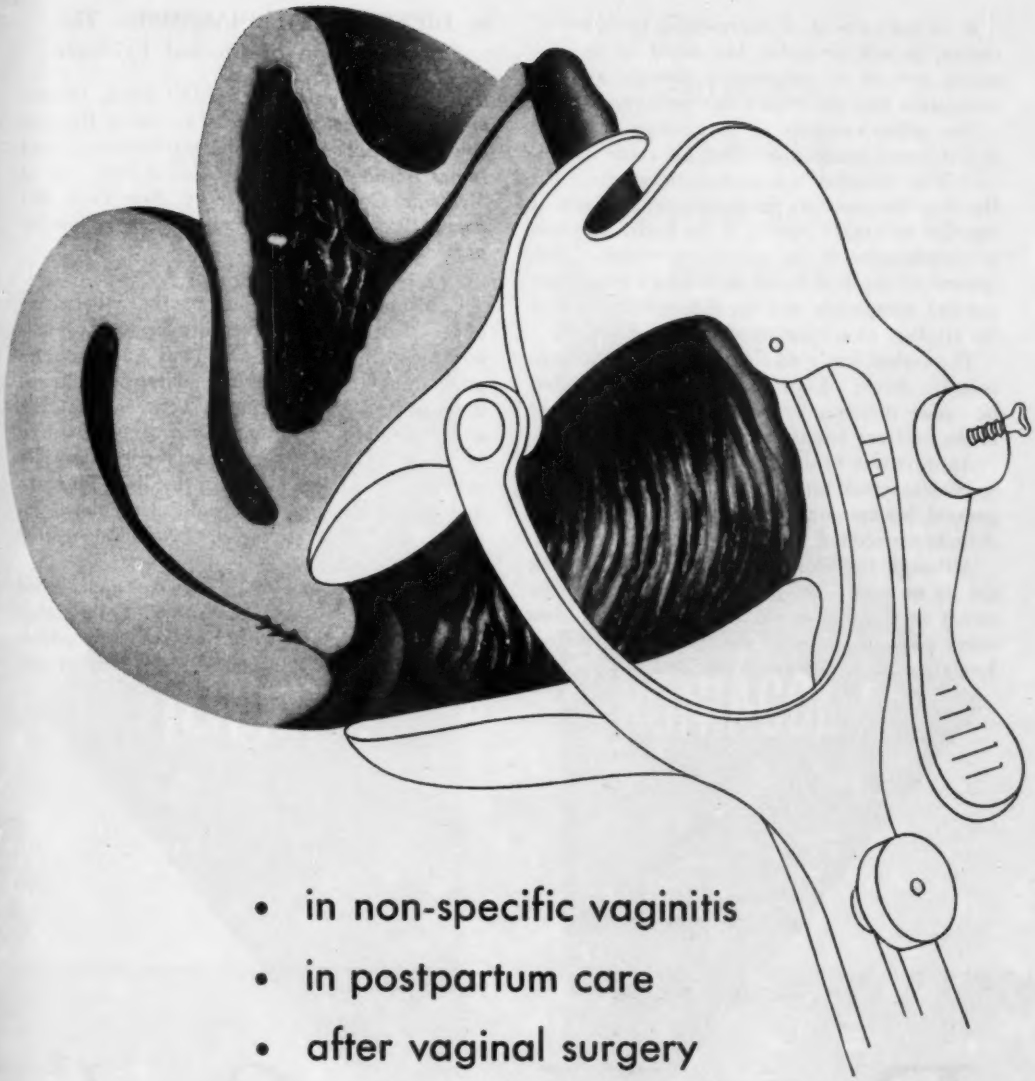
Time 8:45 S.M.

TELEPHONED | PLEASE CALL | WILL CALL AGAIN

1½ oz. tubes and 1 lb. jars

the non-sensitizing antipruritic

Thos. Leeming & Co. Inc. 155 East 44th Street, New York 17, N. Y.



- in non-specific vaginitis
- in postpartum care
- after vaginal surgery

Triple Sulfa Cream

TRADE MARK

Ortho

If the reader is at all interested in problems of cancer, he will be rather fascinated by the immense amount of painstaking thought and investigation that the author has performed.

The author's concept of the etiology of cancer is that lymph stasis is, in effect, the cause of cancer. With detailed histopathologic studies, Dr. Handley demonstrates the lymphatic anatomy of the skin and other tissues of the body. The role of lymphangitis in the genesis of cancer, development of papilloma, radiation and cancer, cancer and occupation, and the different theories of the etiology of cancer are described in detail.

The author freely admits that many critics oppose his theory of lymph stasis and cancer, but he rather disarmingly points out that no proof to the contrary has been offered.

An appendix to the book touches on the present controversial topic of tobacco and cancer. In general, his opinion appears to be that there is a definite connection between smoking and cancer.

Although the theories expressed in this book are by no means accepted in every quarter, the extent of the cancer problem should stimulate every physician to read the thoughts of one of England's outstanding investigators.

Y. S.

► DIFFERENTIAL DIAGNOSIS: The Interpretation of Clinical Evidence

By A. McGehee Harvey, M.D., Head, Department of Internal Medicine, The Johns Hopkins University School of Medicine, Baltimore, and James Bordley, III, M.D., Clinical Professor of Medicine, Columbia University, New York. 665 pages. 1955, W. B. Saunders Company, Philadelphia and London. $11.00.

Clinicopathologic conferences have been one of the most important exercises in our hospitals and teaching institutions. They have, among other things, crystallized the analyses of clinical findings and the correlation between anatomic and clinical observations. One of our eastern journals for many years has reported weekly conferences, and today many medical journals, including the specialty journals, also publish important and illustrative cases from clinicopathologic conferences.

Drs. Harvey and Bordley have approached this subject somewhat differently from the Cabot method customarily employed in clinicopathologic conferences. They have selected from sev-

(Continued on page A-106)

PEN·VEE·*Oral**

Penicillin V, Crystalline (Phenoxymethyl Penicillin)

the totally new penicillin for decisive oral dependability

Supplied: Tablets, 125 mg. (200,000 units), bottles of 36. Also available: Tablets Bicillin®-Vee, 100 mg. (100,000 units) of benzathine penicillin G and 62.5 mg. (100,000 units) of penicillin V, bottles of 36.

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FOR
PROFOUND
VASODILATING EFFECT
IN ACUTE
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CONDITIONS

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VASODILATION
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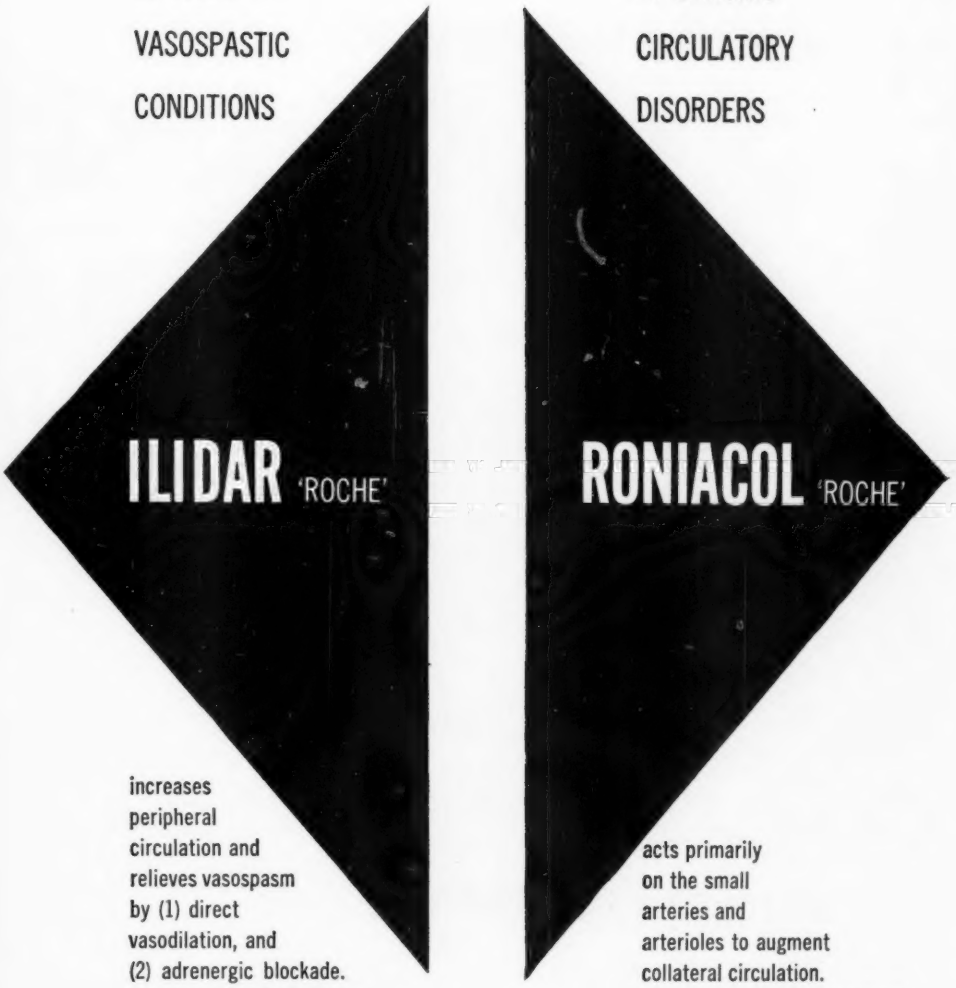
DISORDERS



increases
peripheral
circulation and
relieves vasospasm
by (1) direct
vasodilation, and
(2) adrenergic blockade.
Provides relief from aching,
numbness, tingling, and
blanching of the extremities.
Exceptionally well tolerated.

acts primarily
on the small
arteries and
arterioles to augment
collateral circulation.
Especially useful for long-term
therapy in older
patients whose feet are
"always cold".

HOFFMANN-LA ROCHE INC • ROCHE PARK • NUTLEY 10 • NEW JERSEY

ILIDAR ® — BRAND OF AZAPETINE

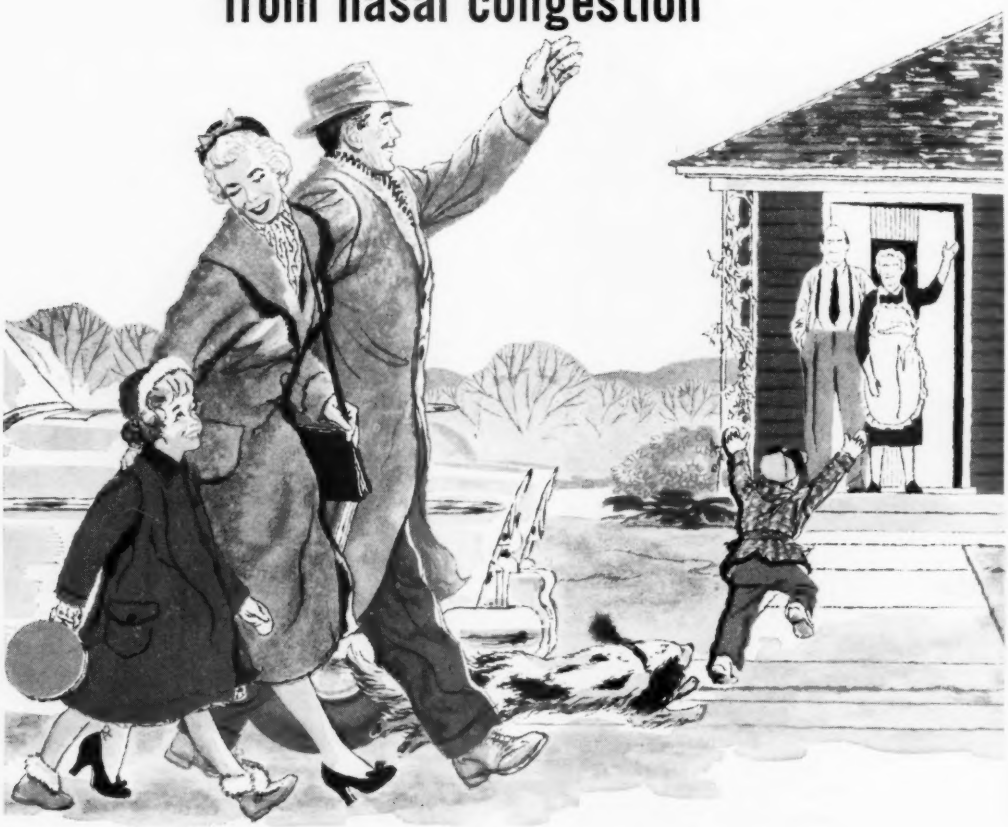
RONIACOL ® — BRAND OF BETA-PYRIDYL CARBINOL

Tyzine®

brand of tetrahydrozoline hydrochloride

"Happy Holidays"

from nasal congestion



nasal patency in minutes for hours

odorless · tasteless
neither stings nor burns
no local reactions

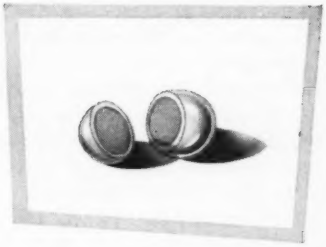
Tyzine Nasal Spray in 1-ounce plastic bottles, containing 15 cc. of aqueous solution, 0.1%.

also available as TYZINE Nasal Solution, bottles of 1 ounce, 0.1%, and TYZINE Pediatric Nasal Drops, in 1/2-ounce bottles, 0.05%.

Pfizer

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc. Brooklyn 6, N. Y.

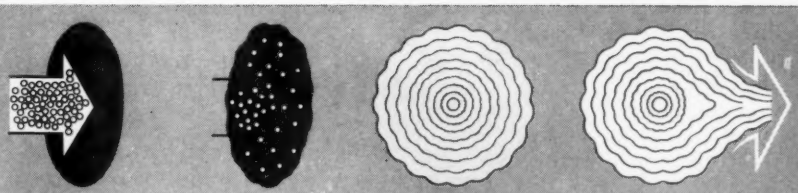
Each microscopic oil globule is encased in a tough, film of Irish moss for perfect emulsification and complete mixing with the stool.



KONDREMUL®

(PATCH)

a *penetrant* emulsion for chronic constipation



KONDREMUL (Plain)—Colloidal emulsion of mineral oil and Irish moss...pleasant-tasting and non-habit-forming. Contains 55% mineral oil. Supplied in bottles of 1 pt.

KONDREMUL WITH CASCARA— 0.66 Gm. nonbitter Ext. Cascara per tablespoon. Bottles of 14 fl.oz.

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eral hundred clinicopathologic conferences as well as from illustrative material without autopsy findings, a method employed in The Johns Hopkins Hospital, in the analyses of these cases. At The Johns Hopkins Hospital the physician who is asked to discuss the case has the privilege of examining the clinical record, x-rays, and electrocardiographic and laboratory results just as if he were called on to see the patient himself. Thus, when a selected case is discussed the listeners are able to follow the reasoning employed by the discussant in interpreting the clinical findings and in requesting certain laboratory examinations. This is somewhat opposite to previous types of clinicopathologic conferences.

The physician begins with the complex and works toward the simple; in this manner he analyzes the clinical findings as he would at the patient's bedside. When using this method the clinician has the advantage of knowing the opinions of other physicians who were called to see the patient. He may agree or disagree with their findings, but he strives at all times to reach a diagnosis based on clinical observations, with laboratory and x-ray examinations to aid in diagnosis. The authors of this text stress that the value of such a diagnostic procedure is not so much in collecting the facts as it is in analyzing the facts; an analysis must be made of the signs and symptoms, and a logical interpretation as well as logical analysis and evaluation made of the ancillary diagnostic procedures used.

Not all of the material selected for this volume is based on autopsy findings—much involves purely clinical diagnostic problems. Here is a challenge to analyze the clinical course as well as the value of the therapeutic agents used. There are 14 chapters on such subjects as aortic insufficiency, heart-failure, pain in the chest, sudden death, failure of urinary excretion, hematemesis and melena, jaundice, hepatomegalia and ascites, lymphadenopathy and splenomegaly, fever of obscure origin, diseases involving the lungs or mediastinum, meningitis, special diagnostic problems including the diagnosis of certain rare diseases, and a chapter on unknown cases for study.

This book is well written and the cases analyzed include explanations of the clinical and physical findings as well as of signs and symptoms. This book can be recommended as an important approach to the differential diagnosis and interpretation of clinical evidence.

S. A. L.

(Continued on page A-108)

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Penicillin V, Crystalline (Phenoxymethyl Penicillin)

the totally new penicillin for decisive oral dependability

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There is definite synergistic action in the combination—producing smooth, gentle, prolonged sedation:

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Q4

► A SHORT HISTORY OF MEDICINE

By Erwin H. Ackernecht. 258 pages with illustrations. 1955, The Ronald Press Company, New York. $4.50.

"To know what to leave out and what to put in; just where and just how, ah, that *is to have been educated in knowledge of simplicity toward ultimate freedom of expression."—Frank Lloyd Wright.**

When Mr. Wright penned these lines, he was thinking in terms of organic architecture, but here is a precept that can well be applied to other disciplines, and the writing of medical history is no exception.

Dr. Ackernecht, who is Professor of the History of Medicine at the University of Wisconsin Medical School, has compressed into 258 pages the important achievements of medicine. He admits that his treatment must be selective but, trained as he is in medicine as well as in medical historiography, he has been able to make his selections justifiable for the most part.

I especially like Dr. Ackernecht's conclusions with regard to syphilis among primitives: "The existence of syphilis in the Old World before the discovery of America has also been claimed on the basis of paleopathologic evidence. But it seems wiser, and more in accordance with the facts, to say only that the bones show remnants of an osteitis of unknown origin." (Pp. 7-8.)

As the reader progresses through the book, he is impressed by the restraint which the author has exercised and the careful weighing which he has given each statement before setting it down. The author knows "what to leave out and what to put in." Each paragraph could be elaborated into a chapter and each chapter could be expanded into a book. One reaches the conclusion that the present volume serves as a splendid introduction for the neophyte. To the reader well versed in medical history what Dr. Ackernecht has left unsaid is just as important. As such a person reads the succinct statements, he fills in the rest of the story, weighs his own conclusions and rebuilds his own hypothesis. This, then, is a book not only for the beginner but also for the advanced reader. Both will profit immensely from its perusal.

T. E. K.

*The Natural House, New York, Horizon Press, 1954, p. 42.

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May we send **samples** *and literature?*

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1. Overall, J. C.: Southern M. J. 47:789, 1954. 2. Editorial: New England J. M. 246:111, 1952.
3. Grayzel, H. G., Heimer, C. B., and Grayzel R. W.: New York St. J. M. 53:2233, 1953.
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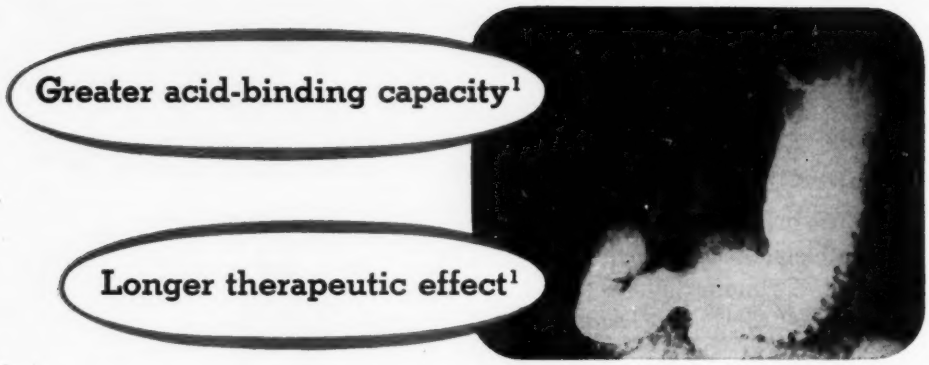

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1. Rossett, N.E., Rice, M.L. Jr.: An In Vitro Evaluation of the More Frequently Used Antacids, Gastroenterology 26:490 (1954).
2. Morrison, Samuel: Magnesium Aluminum Hydroxide Gel in the Antacid Therapy of Peptic Ulcer, Am. J. Gastroenterology 22:309 (1954).

A 19 year old female with a 5 year history of cystic pustular scarring acne of face and back refractory to all other types of therapy.

After 12 weeks of treatment with "Premarin" Lotion applied to face only, remission is apparent. Untreated back remains unchanged.

Excellent results obtained in acne vulgaris

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Conjugated Estrogens (equine) for topical application

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also effective in seborrheic alopecia

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Supplied: No. 875—Bottles of 60 cc. with applicator. Each cc. contains 1 mg. of estrogens in their naturally occurring, water-soluble conjugated form expressed as sodium estrone sulfate.

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1. Shapiro, I.: Postgrad. Med. *15*:503 (June) 1954; J. M. Soc. New Jersey *52*:6 (Jan.) 1955.

2. Shapiro, I.: J. M. Soc. New Jersey *50*:17 (Jan.) 1953.

Ayerst Laboratories • New York, N. Y. • Montreal, Canada

5544

DR. Pepys' Pages

Personal Diary
and Observations on
Medical Life
by MORRIS FISHBEIN, M.D.

Oct. 2—Watched the ball game and interested in the gradual building of intensity as the Dodgers came from behind. Reading also Thomas Mann's last great opus, "Confessions of Felix Krull," a novel full of light and color and gorgeous descriptions so that when the end comes you wish there could be much more.

"He who really loves the world shapes himself to please it."

"One must after all be of educable stuff in order to be educated. He who is made of common clay will never acquire education; he who does acquire it was never crude."

Here is a low estimate of the doctors:

"Indeed, the medical profession is not different from any other; its members are, for the most part, ordinary empty headed dolts, ready to see what is not there and to deny the obvious. Any untrained person, if he is a connoisseur and lover of the body, exceeds them in his knowledge of its subtle mysteries and can easily lead them around by the nose."

"It is useless to warn the courageous against some action on the ground that it requires courage."

"Organic life on earth roughly speaking, has lasted some five hundred and fifty million years. It took some time to get to man."

In the evening played at bridge and gin with the Schuhmanns and with the aid of Mistress Pepys did well.

Oct. 3—At noon to the Standard Club to talk with Sylvia Covet about POSTGRADUATE MEDICINE, and with Friedell and Miss Enge about research on the circulation using "Little Otto," which is a comfort to those who like to sit in a chair watching television. Then saw the Yankees defeat the Dodgers, making it three games each and then returned to my scrivening.

Oct. 4—In honor of Mistress Pepys' birthday enjoyed luncheon and dinner with the family. Barbara entertained for her and white orchids poured in. The Dodgers won the World Series and a running one-handed catch by a Cuban named Amoros pulled victory out of threatened defeat. At night watched "The $64,000 Question."

Oct. 5—At noon came some guests to welcome Basil O'Connor to our city and Mistress Pepys had prepared a fine luncheon. The conversation was merry and interesting with Dan Ryan, Rocky Miller, Coggeshall, Karl Meyer, Russ Stewart, Oscar Getz, Rabbi Mann, Phil Lewin, Ajax Carlson, and Walter Alvarez, Sam Hoffman, Friedell, Justin and the ladies. Then to the Drake where Jessica Greengard entertained for the California Wine Institute and sampled some Rosé which was superb. In the evening to dine sumptuously at the Casino Club for the Lyric Opera guarantors, seeing my friends Vatz, Ednyfed Williams, Louis Maison, and many more and traded stories with Gardner Stern's mama who tells them classically. The champagne poured, Hugh Tompson sang, the chorus did marvels with "I Puritani" and "Il Trovatore" and it was a great enjoyment.

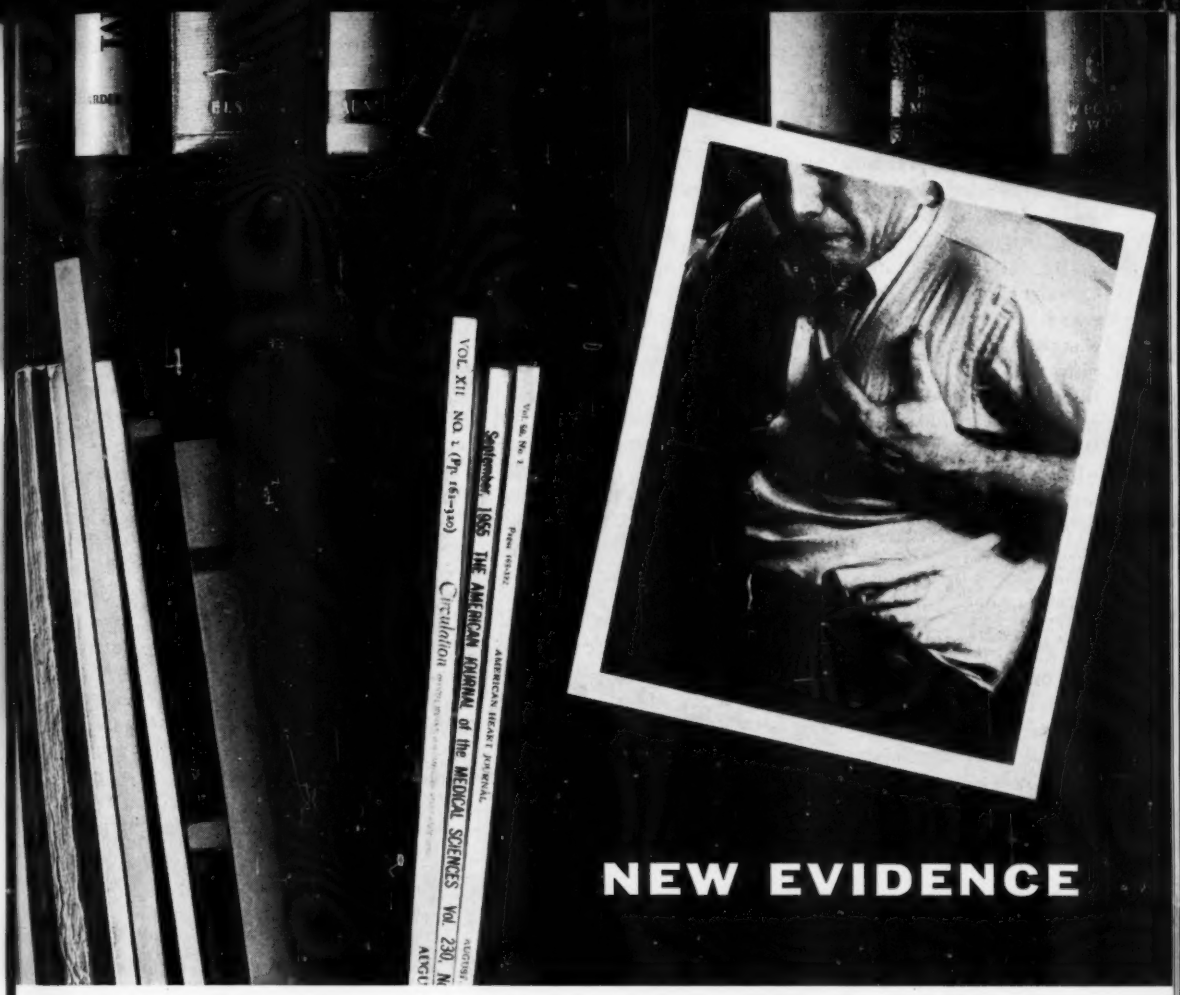
Oct. 6—To hear Basil O'Connor at a meeting of the chapters of the N.F.I.P. tell the story of the vaccine which he did straightforwardly with side lights of humor to the joy of Carlson and Lewin and the ladies who sat with us. So home and back to work until late writing of prednisone and MILTOWN® and similar medicaments.

Oct. 7—At noon to the Chicago Heart Assn. discussing a rheumatic fever program with Dorfman, Stollerman, McCulloch, Simon, Gibson and Christian. Then came Candill from Kentucky to try to interest me in colloidal sulfur which has a powerful smell and afterward Freiwald from Philadelphia to dinner where we talked of the methods of examiners since he had just been through the ordeal of a certifying board.

Oct. 8—By train to Cincinnati where we stopped two hours and photographed the five grandchildren who had come with Marjorie to the station. Then off with Carlson and Lewin to White Sulphur Springs where the polio committees meet.

Oct. 9—After breakfast to play at golf with Norman Topping and John Cotton and Mistress Pepys on the little nine hole pitch-and-putt course and it was not even a good warm up. Read Robert Penn Warren's "Band of Angels," a new symphony on an old theme. He writes most facilely and uses words here and there strange to my vocabulary. He makes to live the problems of races before and during and after the Civil War and makes one

(Continued on page A-116)


VOL. XII NO. 3 (Pp. 161-320)
Circulation
September 1955 THE AMERICAN JOURNAL of the MEDICAL SCIENCES Vol. 230, N
AUGU
AMERICAN HEART JOURNAL
NEW EVIDENCE

How you can prevent attacks of angina pectoris

Three new studies have recently been added to the extensive investigation of Peritrate's effectiveness in preventing attacks of angina pectoris:

For some patients, state Rosenberg and Michelson, Peritrate "may mean the difference between complete, or almost complete, absence of symptoms, or a prolonged illness with much suffering." *Am. J. M. Sc.* 230:*254 (Sept.) 1955.*

"Impressive and sustained improvement" was also observed in a small number of patients treated by Kory *et al. Am. Heart J.* 50:*308 (Aug.) 1955.*

Among anginal prophylactic drugs evaluated by Russek's group "only this agent [Peritrate] appears worthy of the designation, 'long-acting coronary vasodilator.'" *Circulation* 12:*169 (Aug.) 1955.*

By prescribing Peritrate on a continuous daily dosage schedule (10 or 20 mg. 4 times a day) you can diminish the number and severity of attacks... reduce nitroglycerin dependence . . . increase exercise tolerance . . . improve abnormal EKG findings.

Usual dosage: 10 to 20 mg. *before meals* and at bedtime.

Five dosage forms for your convenience: *Peritrate* 10 mg. and 20 mg.; *Peritrate Delayed Action* (10 mg.) for extended protection at night; *Peritrate with Phenobarbital* (10 mg. with phenobarbital 15 mg.) where sedation is also required; *Peritrate with Aminophylline* (10 mg. with 100 mg. aminophylline) in cardiac and circulatory inadequacy.

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(BRAND OF PENTAERYTHRITOL TETRANITRATE)

WARNER-CHILCOTT

realize how the problems may torture the minds of those closely involved.

Oct. 10—In the morning to consider grants for fellowships, education, recruitment of nurses, occupational and physical therapists and social workers, with Bob Buerki presiding. In the afternoon concerned with the problems of the respiratory centers which are a glorious project filling a desperate need. Next nine holes of golf with Topping, Cotton and Norton, who is the head of the Board of Health of North Carolina, and after dinner relaxed at bridge with Basil O'Connor, Howard Rusk and Buie, losing some 20 cents.

Oct. 11—With the Committee on After-Effects discussing research in neurophysiology with a baffling nomenclature and side trips into electronics. Once more at golf and then more bridge and at dinner Basil O'Connor with great humor presented gifts to Jessie Wright and Phil Lewin and all applauded for their wonderful devotion and service to those crippled by poliomyelitis.

Oct. 12—Now the Committee on Virus Research with Tom Rivers presiding and many problems yet remain in virology and vaccination against poliomyelitis. Late in the afternoon played nine holes with O'Connor, 58; Lewin, 59; Topping, 46, and old Pepys, 48—and those are scores, not ages. Then to dine and played bridge with O'Connor and Gus and Zelma Buie, and Gus and I lost again, albeit we play better but are unfortunate.

Oct. 13—The General Advisory Board resurveys all the recommendations with Frank Ober presiding. Then old Pepys detected a great rain pouring down so went to play at "Scrabble" with Jeanie Lasdon who is very proficient. Mistress Pepys and Stanley Lasdon were kibitzers and we had no dictionary so there were protests by the kibitzers on "Yo-yo," "teen," "xyster" and "zoa." The rain continued to pour and at night en route to New York.

Oct. 14—At the Waldorf amidst great headlines in the press of winds blowing and a storm brewing. Met Retter of Eli Lilly in the lobby. So stayed indoors conferring with John Welsh and H. B. Parmele. Next table at luncheon sat Maurice Chevalier and old Pepys felt older on seeing him. Toward evening contributed to M. Soroko of Revlon and then with him to Lindy's where we saw Phil Spitalny and Evelyn and then all to

(Continued on page A-118)

in rheumatoid arthritis

now available...the second
new Schering corticosteroid

METICORTelone

PREDNISOLONE (metacortandralone)

Schering

"possesses an augmented therapeutic ratio"
over cortisone and hydrocortisone

METICORTELONE,* brand of prednisolone (metacortandralone).
*T.M.

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MAJOR ADVANTAGES: Action detectable within 15 minutes; complete reversal of hypoprothrombinemia within 4-12 hours.

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INDICATIONS: Hypoprothrombinemia due to Dicumarol®, Cumopyran®, Hedulin®, Tromexan®, antibiotics, salicylates, obstructive jaundice, hepatic disease, impaired gastrointestinal absorption, and deficiency of vitamin K in the newborn.

SUPPLIED: In boxes of six 1-cc. ampuls, each cc. containing 50 mg. of vitamin K_1.

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see "Oklahoma!" in Todd-AO color process which was startlingly realistic with verve and exciting singing and dancing and worthy of encomiums.

Oct. 15—All morning at my scrivening and then to Katonah to dinner with the Bill Lasdons. The rains poured and poured and after an evening of delightful converse of friends and books and research, back to the city finding all the roads flooded—indeed converted into rushing streams, so that the one hour trip took two and a half and we should have used a boat.

Oct. 16—For breakfast came the Haneys from Newton, Mass. and Lavine and Entin from Passaic. Then rain still drizzling so we drove to Passaic—commonly called "Passiac" in the midwest. Old Pepys inspected the old hospital of Beth-El and then the structure of the new one. Then came a multitude to dine in a bingo parlor where the mayor, senators, congressmen and officers and Drs. Schefrin and old Pepys spoke—also Rabbi Gerstein, whom I knew in Chattanooga, gave the invocation and the Reverend Talbot, formerly of Chicago, the benediction. Next driving back to New York and with Mistress Pepys to see "The Desperate Hours" with Humphrey Bogart and Frederic March and it was suspenseful and thrilling.

Oct. 17—To breakfast came Stan Henwood and then to Doubleday's for meetings about new books. At luncheon Hart Van Riper on polio matters. In the afternoon Howard Behrman and then to dine with Arthur Master, his lady and the family. Next to see "Diary of Anne Frank" with Joseph Schildkraut and a genius in the name part—a girl named Spasberg—who will go far in her profession. The play was so moving that its spell lingers and lingers and cannot be forgotten.

Much amused at a market letter from a stockbroker which concludes:

"Since it appears that the market will fluctuate in a broad trading range, the proper course for the short term investor appears to be to sell securities on a scale-up when stocks are in the upper zone of the trading range, and buy on a scale-down in the lower area of the range."

This is jargon at its worst and reminiscent of a lullaby that was sung by Fannie Brice with the refrain: "Buy Low, Sell High, Baby!"

Oct. 18—To breakfast Will Craft for editorial discussion. Then Gobind Lal for more of the same. At noon with Joe Marks and Oman of Oxford University Press to lunch at Café Brussels where *filet sole Ostend* is the *pièce de résistance* and worked out a plan for a textbook edition of the marriage book. In the afternoon came Mel Evans for a conference on our encyclopedia and Krupnik of Panair on a television program and Rose Soroko to confer with Mistress Pepys about the wedding of Doris and Frederick Berger and Shirley Gibbons to discuss plans for Miltown. And home on the Century, meeting Ronald Helps who is now with Pfizer and Roerig.

RED FACES

A man sprinkled the powder on his shoes that was supposed to hold his dentures in place.

A doctor received samples of a food called "Friskies" and after trying it discovered it was for puppies.

Oct. 19—The desk piled high but with Z. W. made light work of it. At noon to the Chicago *Sun-Times'* executive dining room where Russ Stewart presided over the committee which will build a research center at La Rabida as a memorial to Dick Finnegan. Here were former Mayor Kennelly, Herb Graffis, Henry Crown, Pierre De Met, Cleary, Lee Schooler, Maurice Goldblatt, Albert Pick and many more. So committees were formed and plans made.

Oct. 20—Began revisions of two of my books. This is necessitated by the rapid progress of medical science, particularly in pharmacology, biochemistry, immunology and virology—and perhaps the rapidity of advance in basic science has put so much pressure on the clinicians that new observations at the bedside are rare.

Oct. 21—A long visit with Frank Calderone who continues to effervesce with plans but finds great resistance toward their adoption.

Oct. 22—Early awake to shop with Mistress Pepys. In the afternoon saw the first half of Minnesota vs. Michigan and found that youth still has more energy but the experienced veterans get the final result. In the afternoon to congratulate Dr. William S. Hoffman and to visit the new beautifully equipped, economically designed Sidney Hillman Health Center which the garment workers subsidize and utilize. Next to Evanston where Rocky Miller and

(Continued on page A-120)

for equanimity [1,2] . . .

new anti-anxiety factor
with muscle-relaxing properties
relieves tension

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Supplied: Tablets, 400 mg., bottles of 48.

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2. Borrus, J.C.: J.A.M.A. **157**:1596 (April 30) 1955.

*Trademark

his lovely lady received for Governor Stratton and his family. The great Northwestern University sprawls along the lake shore and all the fraternity houses were brilliantly decorated for the occasion. So chatted with the Governor about Justin and gossiped with Judge Julius Hoffman about the presidential candidates and renewed reminiscences with former president Franklin Snyder.

Oct. 23—Read the "Innocent Bystander," by Barbara Frost, a crime story with a woman lawyer based on an intricate legal technicality which makes a long way to go for confusion. All of it seems heavily contrived and therefore to be recommended to insomniacs who will fall asleep with it seven nights before finishing it. After luncheon, to which came Tom Hull and his lady, to speak in the Museum of Science and Industry on "Live Longer and Like It." Here were M. Edward Davis and his lady and Julius Hess and some hundreds of young and old members of the great public. In the evening to dine with the officers and fellows of the American College of Gastroenterology, viewing their convocation, and heard Ross McIntire tell of the conservation of human resources.

Oct. 24—At my desk and spoke for the luncheon of the gastroenterologists on progress in their field, predicting that the tranquilizers will reduce the incidence of peptic ulcer.

Oct. 25—At noon with George Mohr to tell the staff of the Edgewater Hospital of the Hebrew University and to gain their support. Here luncheon with Mazel and Boros, and in the evening to the dinner of the Michael Reese Medical Research Institute where Joseph Weil presided. Louis Katz told of their aims, needs and achievements and Dr. James Shannon, who directs the National Institutes of Health, pointed out that expenditures for medical research have tripled but that public and industrial contributions are still needed. All the departments headed by such as Tannenbaum, cancer; Necheles, gastrointestinal, and Singer, hematology, showed their work to the enraptured multitude.

Oct. 26—To a great dinner at the Standard Club for the Lyric Theater; Marie Callas was present; two bassos, a soprano and a contralto entertained and the director spoke so charmingly of opera and its significance that hundreds of converts must have been won.

Oct. 27—Stanley Henwood visited to talk of plans. To the Crerar Library to read recent periodicals. In the evening to the Morrison for a great banquet raising some hundreds of thousands of dollars for the university library in Israel, honoring Sam Katzen and Maxwell Abbell and hearkening to the golden voice of Abba Hillel Silver.

Oct. 28—In the evening come I. Snapper and Owen Wangensteen for supper and with them gastroenterologists Spellberg, Lawrence, Winkelstein, Weiss and all the ladies, also Paul Hodges, Coggeshall, H. Popper and many more. Mistress Pepys prepared viands and fluids to delight the gastronomic mechanism and all fell off their diets with joyous abandon.

Oct. 29—In the morning old Pepys hearkened to a discussion of gastric cancer in which Alton Ochsner, I. Snapper and Oberhelman participated. Statistics took a beating and it all came down to the question of individual competence and what would you do if it happened to you? At noon Asher Winkelstein and his lady entertained at luncheon for Snapper, Ilingworth of Glasgow, old Pepys, James Nix and others. Thereafter watched a champion Michigan team come from behind to defeat Iowa.

Oct. 30—Sylvia Covet came to lunch and some hours spent talking of POSTGRADUATE MEDICINE. Then admired Esther Williams teaching the Yale boys to swim. Higher education ain't what it used to be. So finished "Heritage," by Anthony West, a most literate story, and began "The Haunted Hacienda," by Madison Cooper and lost two out of three games of "Scrabble" to Mistress Pepys.

Oct. 31—At the desk and wrote of medical progress. Found these two quickies in Max Shulman's collection of humor.

He: "Say 'when'."
She: "After the next drink."

Northern Girl: "You may."
Southern Girl: "You all may."

In the evening to the opening of the new Lyric Opera season where Callas received ovation after ovation singing "I Puritani." The orchestra and scenery were gorgeous and the audience resplendent in diamonds and furs and top hats—for Chicago the beginning of a new era.

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NEW palatability, **NEW** convenience, **NEW** versatility . . . the same unexcelled efficacy and toleration

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PHARMACEUTICAL SPECIALTIES, SURGICAL INSTRUMENTS, PEDIATRIC AND DIETETIC FOODS, MEDICAL BOOKS AND OTHER PRODUCTS AND SERVICES

Abbott Laboratories
- Desbutal A-30-31
- Tronothane A-35
- Erythrocin A-68-69
- Tridione; Paradione; Phenurone; Gemonil .. A-75
- Nembu-Serpin A-107

American Bakers Association
- Enriched Bread A-91

American Meat Institute
- Pork A-52

Ames Company, Inc.
- Clinitest A-2
- Aminet A-76

Armour Laboratories, The
- HP Acthar Gel A-26

Ayerst Laboratories
- Mysoline A-57
- Premarin Lotion A-113

Burroughs Wellcome & Company, Inc.
- Neosporin Ophthalmic Solution A-42
- Tricoloid A-124

Chatham Pharmaceuticals, Inc.
- Koagamin A-38

Ciba Pharmaceutical Products, Inc.
- Pyribenzamine Expectorant A-10-11-86-87
- Serpasil A-20-82
- Serpasil-Apresoline; Serpasil A-22-23
- Antrenyl-Phenobarbital A-46-47
- Doriden ..... A-74-78-90-Fourth Cover
- Serpasil Elixir A-122-123

Davies, Rose & Co., Ltd.
- Quinidine Sulfate A-108

Davis & Geck, Inc.
- Melmac Bandages A-79

Desitin Chemical Company
- Desitin Ointment A-111

Doho Chemical Corp.
- Rhinalgan A-29

Eastman Kodak Company
- X-Ray and Photographic Supplies .... Facing A-76-77

Geigy Pharmaceuticals
- Eurax A-27

General Electric Co.—X-Ray Dept.
- Maxiservice A-59

Hoffmann-La Roche, Inc.
- Romilar; Gantrisin ..... Facing A-16-17
- Ilidar; Roniacol A-103
- Noludar A-109

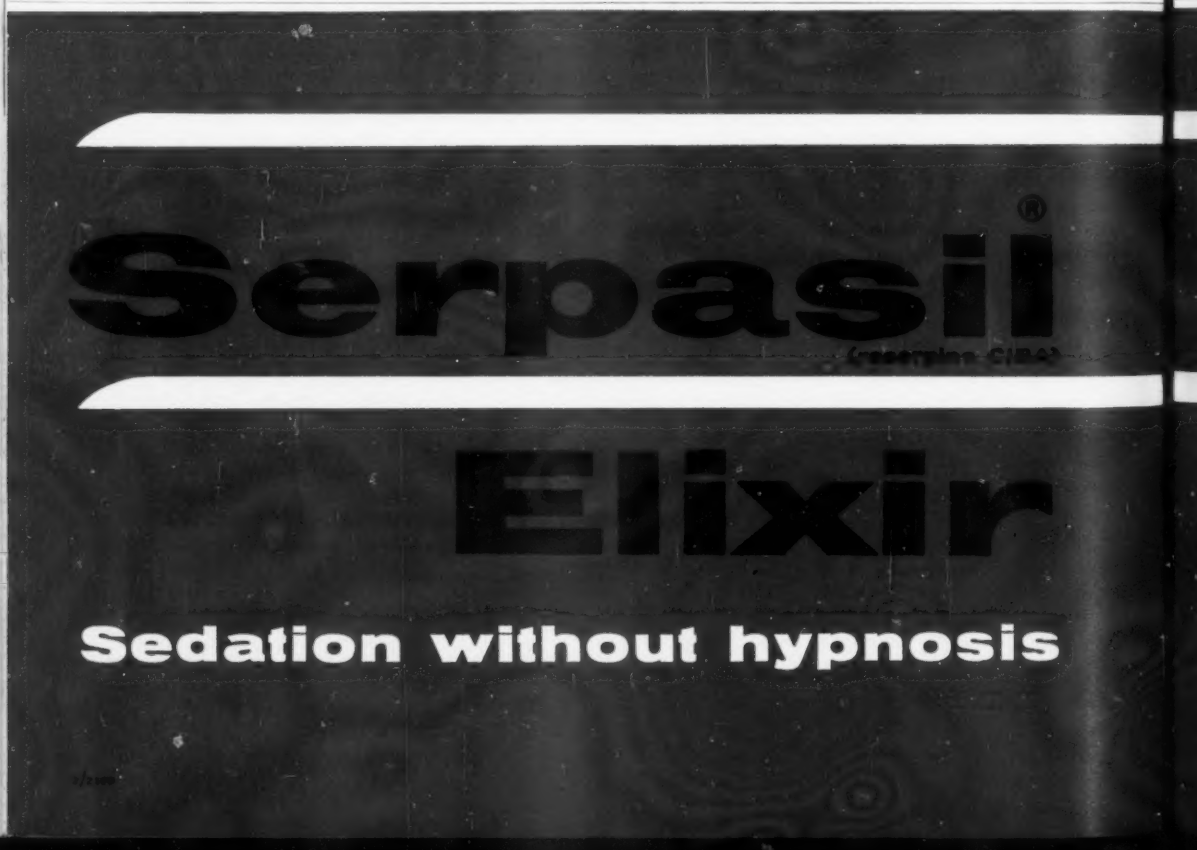
Knox, Chas. B., Gelatine Co.
- Gelatine A-71

Lakeside Laboratories, Inc.
- Tridal A-64
- Piptal A-65

Lederle Laboratories
- Pathilon A-13
- Folbesyn A-40
- Perihemin A-43
- Aureomycin A-54-55
- Achromycin A-66-67
- Diamox A-77
- Stresscaps A-89
- Hibicon A-97
- Mumps Vaccine A-99

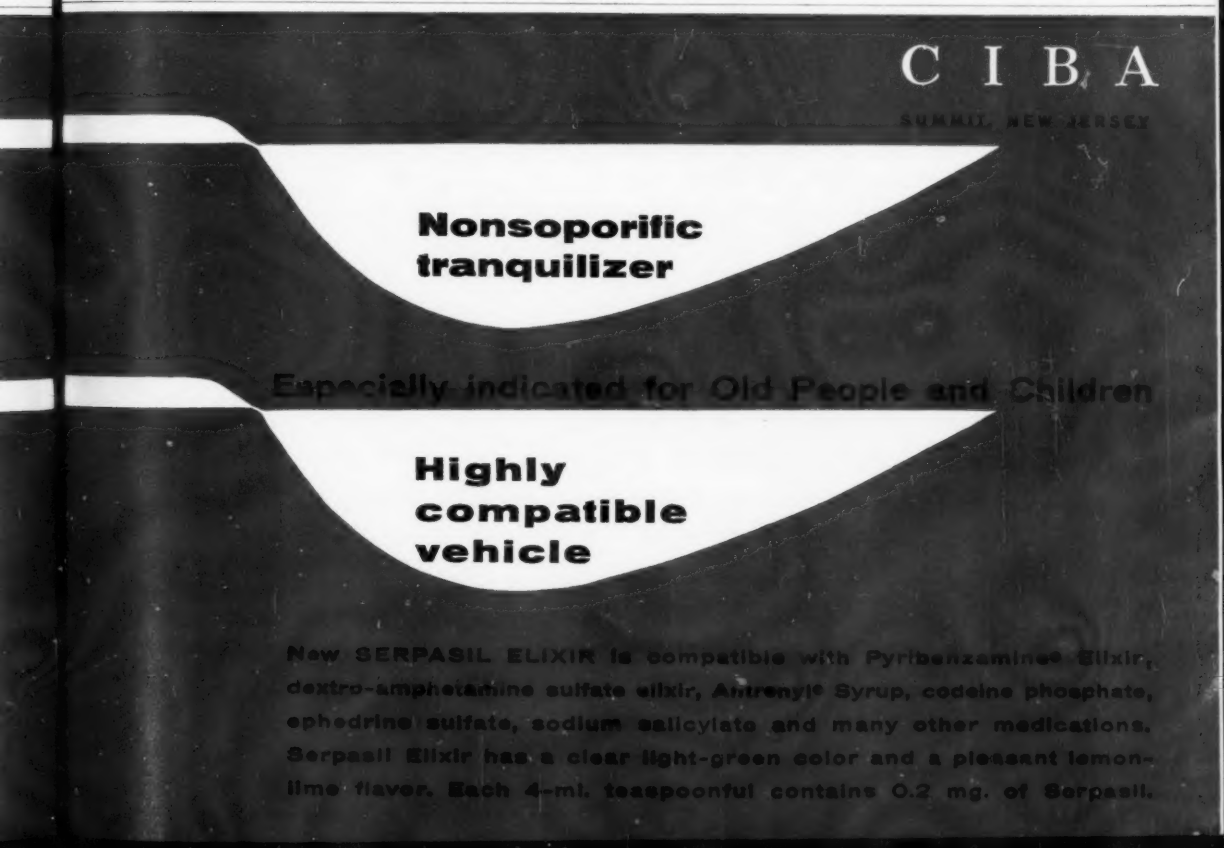
Leeming, Thos., & Company
- Nephenalin A-36
- Calmitol A-100

Lilly, Eli, & Company
- Sandril with Pyronil A-33



Technical Exhibits—*Continued*

McNeil Laboratories, Inc.
Clistanal ... A-45
Butiserpine ... A-93
Mutual of Omaha
Insurance ... A-99
Nuclear—Chicago
Mediac ... A-92
Ortho Pharmaceutical Corp.
Rarical ... A-49
Triple Sulfa Cream ... A-101
Parke, Davis & Company
Geriplex ... A-61
Parker, White & Heyl, Inc.
B-P Formaldehyde Germicide ... A-53
Patch, The E. L., Company
Kondremul ... A-105
Pet Milk Company
Evaporated Milk ... A-62
Pfizer Laboratories, Div. Chas. Pfizer & Co., Inc.
Sterane ... A-3
Terramycin ... A-21
Toclase ... A-51
Cortril Vaginal Tablets ... A-84
Tyzine ... A-104
Tetrabon; Tetrabon SF ... A-121
Pitman-Moore Company
Poliomyelitis Vaccine ... A-80
Veralba/R ... A-81
Revlon Products Corporation
Cosmetics ... A-96
Riker Laboratories, Inc.
Rauwiloid ... A-28
Rauwiloid and Combinations ... A-83
Roerig, J. B., & Company
Am Plus ... A-63
Rorer, William H., Inc.
Maalox ... A-112
Sandoz Pharmaceuticals
Cafergot-PB ... A-73
Saunders, W. B., Company
Medical Books ... A-14-15
Schering Corporation
Sigmagen ... A-6-7
Meticortelone ... A-12-44-88-116
Coricidin ... Facing A-92-93
Searle, G. D., Company
Metamucil ... A-1
Sharp & Dohme, Div. of Merck & Co., Inc.
Remanden ... Second Cover
HydroCortone-T.B.A. ... A-17
Redisol ... A-85
Mephyton ... A-117
Tracinets ... Third Cover
Sherman Laboratories
Protamide ... A-32
Squibb, E. R., & Sons, Div. Mathieson Chem. Corp.
Raudixin ... A-25
Pentids ... A-41
Mysteclin ... A-94-95
Wallace Laboratories, Div. Carter Products, Inc.
Miltown ... A-19
Warner-Chilcott Laboratories
Calcisalin ... A-16
Peritrate ... A-115
Welch Allyn, Inc.
Diagnostic Instruments ... A-110
White Laboratories, Inc.
Mol-Iron Tablets ... A-39
Winthrop Laboratories, Inc.
Levophed ... A-8
Wyeth, Inc.
Bicillin-Vee ... A-4
Streptomagma ... A-37
Pen-Vee Oral ... A-99-102-106
Equanil ... A-119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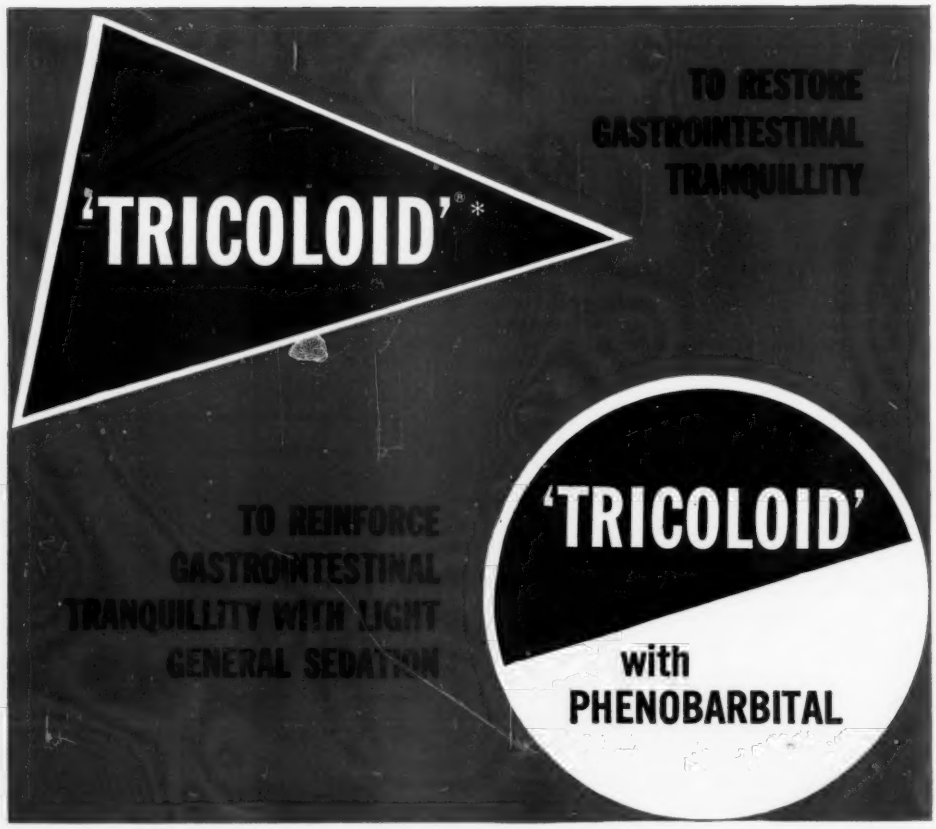

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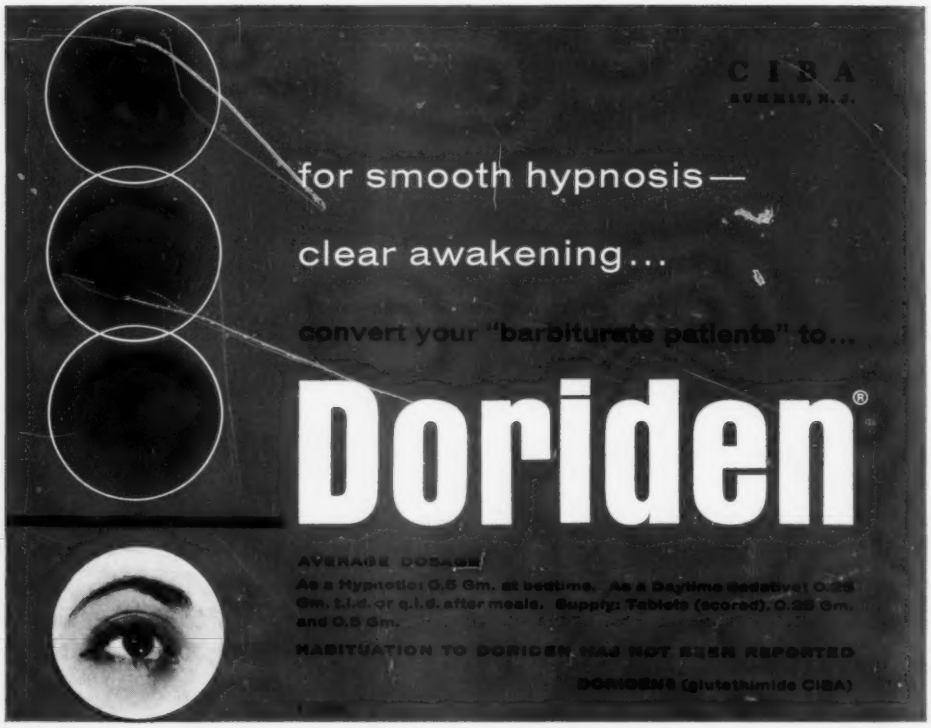
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